VOL. XXXIII. No. II NOVEMBER 1948

# MECCANO MAGAZINE

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6D.

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**No. 25v**
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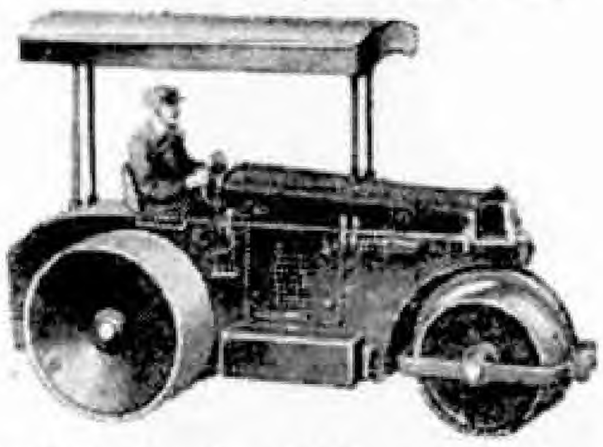

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# MECCANO MAGAZINE

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England

Vol. XXXIII
No. 11
November 1948


## With the Editor

### The British Aircraft Industry

Events of the last few weeks have focussed attention once more on the importance of our aircraft industry. Hundreds of thousands of people in Berlin have been kept alive and at their jobs by the great British-American "Air Lift." Fighter production in this country is being doubled, not because we want war but because, as in that glorious but sad Summer of 1940, a strong Royal Air Force is still the spearhead of our national security. On a more peaceful note, two British helicopters and a British jet-'plane have carried a letter from the heart of London to the centre of Paris in 47 minutes—a striking example of how civil aviation, if freed of international restrictions, could bring the countries of the world closer together.

It is tragic that, at a time when our new civil air liners show such great promise for the future, the British Aircraft industry must gear itself again to war production. We had hoped that the need for defence against aggression had passed, but to-day the industry, while still planning for peace, must forge the weapons that alone can make our country strong. Perhaps its achievements are not so widely publicised as those of other industries in other countries, but that does not mean that we have nothing to shout about. As Mr. Taylor points out in his article on pages 372–4, British "Jets" are still the best, and our designers and technicians have the skill and craftsmanship necessary to retain that lead.

To-day, more than ever before, every man and woman, every boy and girl in this country must be air-minded, for the future of the British Commonwealth of nations lies as surely in the air as once it lay on the broad oceans.

### A New Pennine Tunnel

The driving of a new main line railway tunnel nowadays is something of an event. The recently-opened tunnel at Thurgoland, alongside the original one, on the Eastern Region main line from Manchester to Sheffield, is therefore of special interest. It is not a long bore—330 yards—but it is important as an essential part of the Manchester and Sheffield electrification scheme. It would have been difficult to get sufficient clearance for the overhead electrification equipment for two lines in the old tunnel. So the down main line from Sheffield now runs through the new tunnel, and the up line is realigned in the centre of the old one.

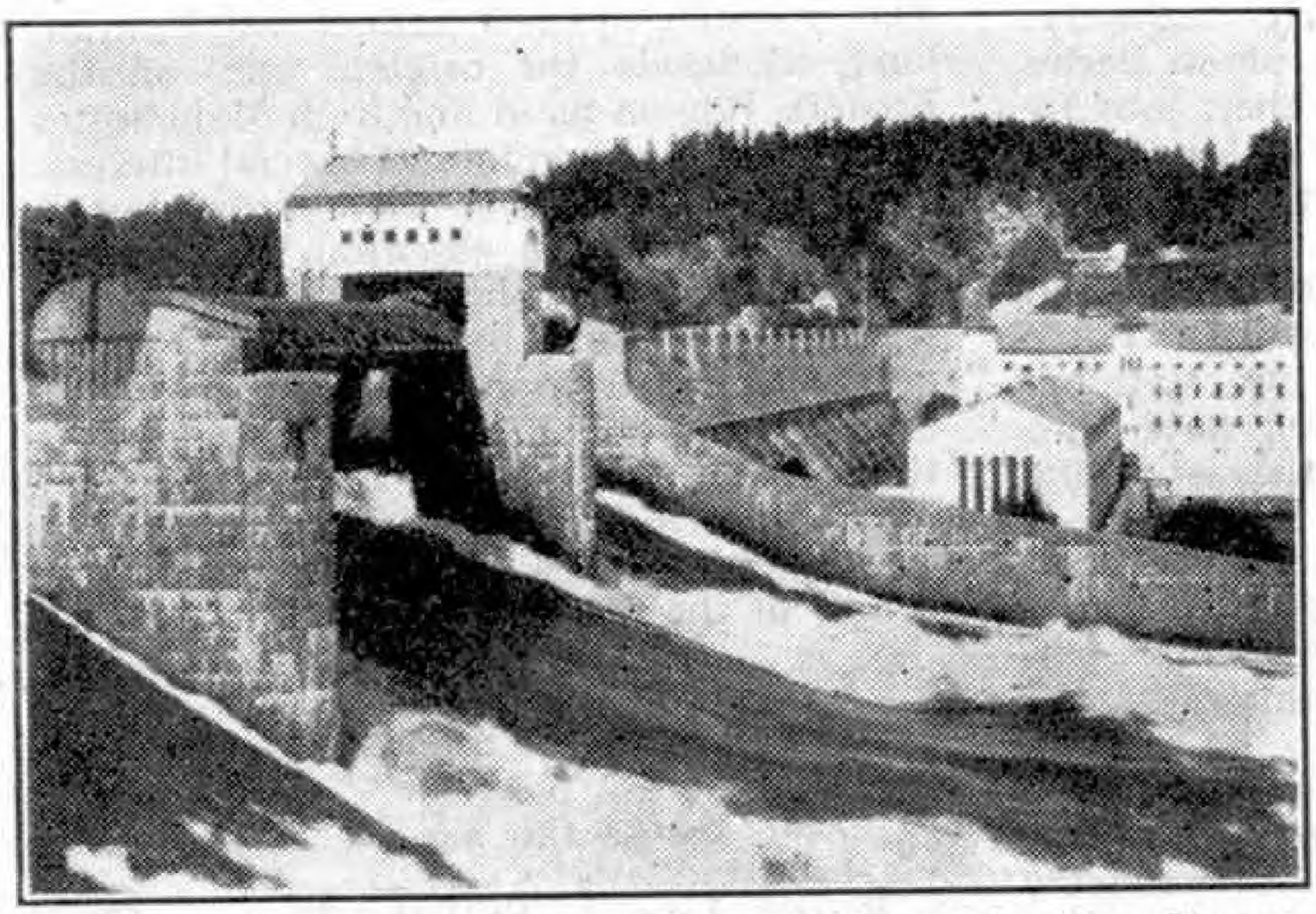
**This Month's Special Articles**

# Power Across the Sea

By Arthur Nettleton

WHEN in the future you switch on the electric light or some labour-saving electrical device, the necessary current may be generated in far-away Scandinavia. Factories in the United Kingdom may similarly be run on electricity "imported" from the same distant source, for a scheme to bring electric current from Norway, by cables laid on the bed of the North Sea, has been examined, and technicians report that the project is quite practicable.

The plan so far visualised is to run a double cable from Egersund, in South-West Norway, to a point near Berwick-on-Tweed. This is not quite the shortest line between Norway and Britain, but the distance will be no more than 350 miles. Single cables of greater length than this, have already been made for submarine telegraph purposes, and no great difficulty is likely to arise in making a high-power cable that will stretch from Scandinavia to North-East England. Nor would the laying of this electric power line on the sea bed present any real problems. The Post Office cable ships, normally used for laying telegraph and telephone cables, could tackle this other job equally well. The overall depth of the suggested route is 40 fathoms, and many telegraph cables in use to-day lie at a greater depth than this.



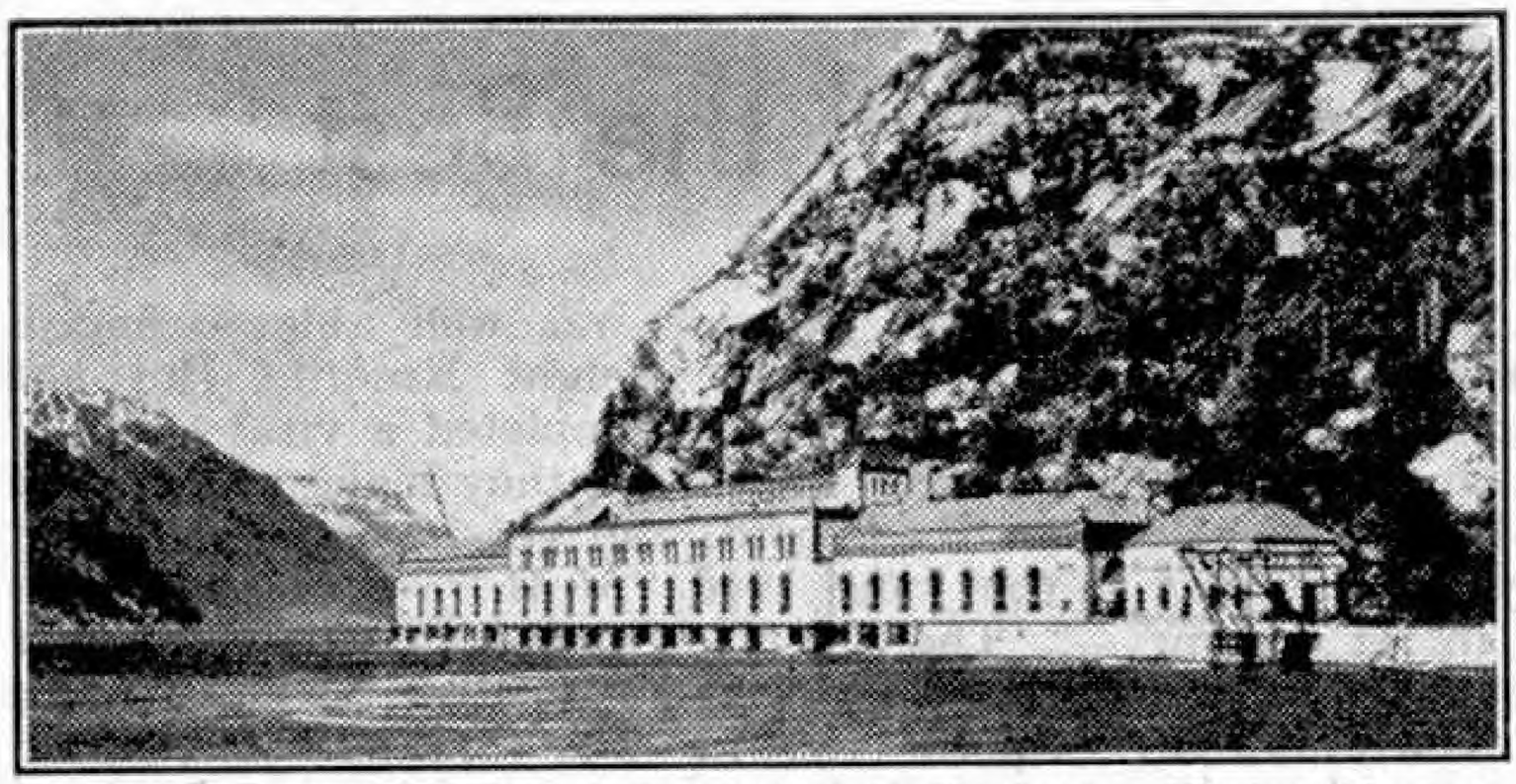
**The Vamma hydro-electric power station at Askim, on the River Glomma, in Norway.**

In Norway a Government Committee has carefully investigated the proposal, and detailed figures have been got out to show that the project is perfectly feasible, so far as the potential output of electric current is concerned. The great generating stations of the Scandinavian country derive their power from the mountain torrents that hurtle down the precipitous sides of the fjords and drive gigantic hydro-electric plant. During the last 25 years big strides have been made in developing this source of electric power. A 10-year plan proposed by the Norwegian Government is intended to double the present capacity of 1,800,000 KW, at a cost of about £100,000,000. Even then, less than one-third of the country's available water-power will have been harnessed.

Potentially Norway thus has ample supplies of hydro-electric power for export. Sweden as well as Britain is interested in the matter, and a grant has been made towards the cost of the construction of an overland cable from Norwegian power stations to the Swedish frontier.

Norway was one of the very first countries in the world to generate electricity by means of water power. A hydro-electric power station was built on the River Glomma, the longest waterway in the country, as far back as 1899. Other stations, built more recently, include those at Meraker, Follafoss, Askim, Rjukan and Holsvassdraget. For years, such sources of electric current have lighted Norway's houses, run machinery in her factories, and illuminated the streets of Oslo and other places. Moreover, they have done so cheaply, for the use of hydro-electric plant is the most inexpensive way of generating electricity.

The chief difficulty in carrying current by submarine cable is that it must be converted from alternating to direct current while under water, as otherwise too much power would be lost on the way. Rectifying plant would be required at



The Tyssedal hydro-electric power station, in Hardanger, Western Norway, which supplies power to a large aluminium works.

Egersund to convert the current from alternating to direct, and at Berwick to reconvert from direct to alternating.

This has hitherto been an insuperable snag at high voltages—and a North Sea cable would have to carry 300,000 volts! Now, however, wartime experiments have shown a way to solve the problem. During the war considerable attention was paid to the transmission of large blocks of electric power. Both in Britain and Germany intensive research was undertaken in this direction, and British scientists had a plan to "export" electricity to France by means of cables on the bed of the English Channel, if the need arose.

In Germany, much the same sort of experiments were carried out at a high-tension rectifying station near Berlin. Since the war German experts who took a leading part in the work have been engaged in further experiments in London. It is likely that the problem of devising rectifying stations for Norwegian-British power transmission may be solved in a comparatively short time.

Further assistance has been obtained from Japan, where a number of underwater power cables were in fact established a few years ago. The distances involved there are smaller than those of the projected Norway-Britain route, but invaluable data has been gathered in the Far East. A submarine electric power cable also already connects Sweden and Denmark, although here again the distance is much shorter than that between Norway and Britain.

Apart from augmenting our own output of electricity, imported current would result in a big saving of coal in future years. That saving must be set against the cost of the scheme. It is estimated that the 350-mile cable would cost about £5,000,000 to make, and another £1,000,000 to lay. In addition, the rectifying plant and distributing arrangements would entail a further big outlay of cash. But, once established, this electrical import system would be very cheap to run. Almost the only expense would be the maintenance costs. Even this charge can be reduced by modern science. Electrical engineers have devised automatic power stations,

(*Cont. on page 409*)



This photograph of the Rjukan power station shows the pipe lines descending the mountain side.

# British Jets are still the Best

By John W. R. Taylor

BRITISH jet engines are still the best in the world. Even the Americans admit that. In fact the great American engine manufacturers Pratt and Whitney are going to build the Rolls-Royce "Nene" under licence, because they believe that Rolls-Royce lead the world in jet design. The importance of this tribute to British engineering skill cannot be overestimated, for any aeroplane is only as good as its engine allows it to be, and the country with the best engines is also potentially the country with the best civil air liners and warplanes.

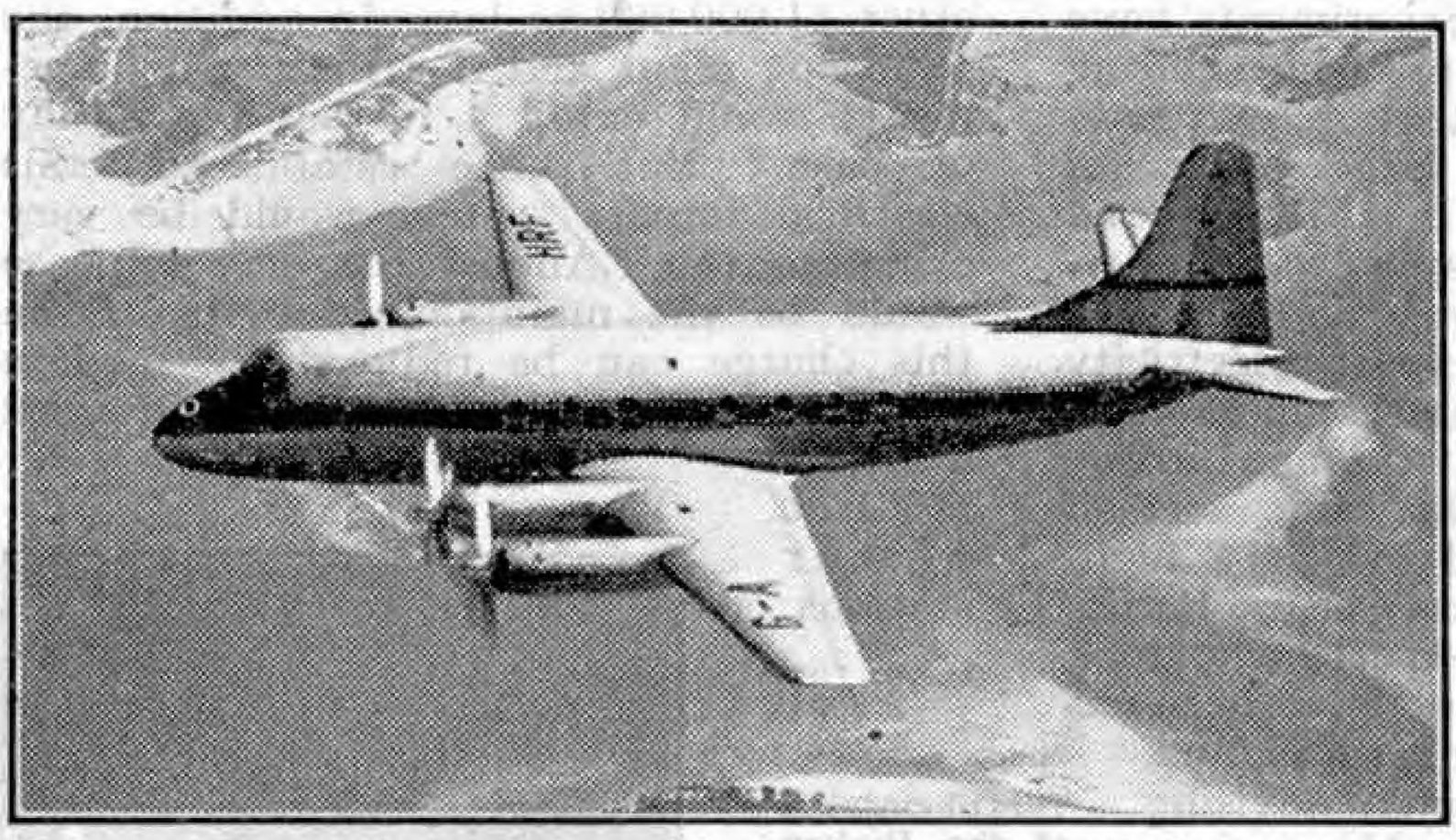
"All right, then," many people will say, "if British jets are so good, how do you explain the fact that an American jet 'plane, with an American engine, holds the World's Absolute Speed Record?" The answer is that it is not the policy of the British Government or aircraft industry to establish records, unless useful technical data will result from the flights. For example, the Saunders-Roe SR/A1 jet-fighter flying boat, which has been flying consistently well for about two years, is quite capable of setting up a whole string of new seaplane records, its top speed of over 500 m.p.h. in fighting trim being some 60 m.p.h. higher than the existing International Speed Record for seaplanes. But Saunders-Roe are much tóo busy developing the aircraft for sterner duties to take time off for records.

Similarly, de Havillands knew for a long time that the "Vampire" they were using as a flying test-bed for their new "Ghost" engine was well able to smash the aeroplane Height Record. But not until they had completed a vital series of research flights did they make an attempt on the record, and get it, as described in the June 1948 *"M.M."*

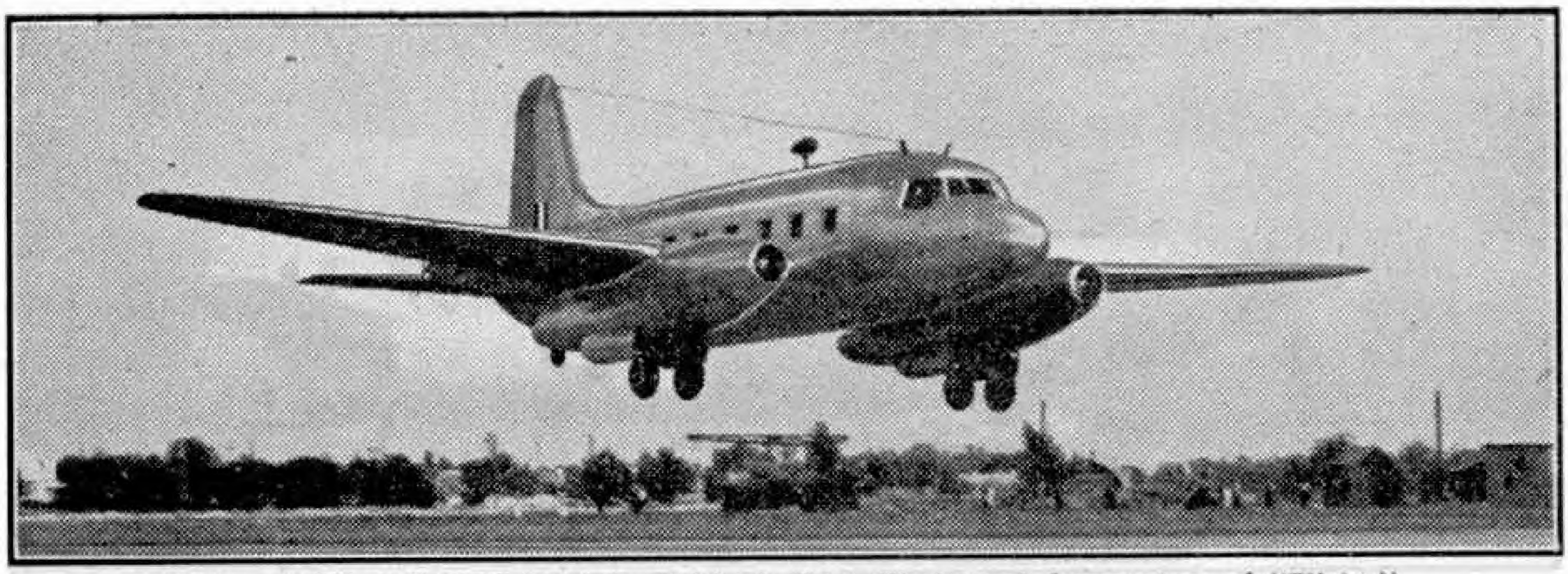
The new Height Record, the fact that the International 100-Km. Closed Circuit Speed Record was broken by British aircraft four times in eight months, and is at present held by a de Havilland 108 with a speed round a five-cornered course only 65 m.p.h. less than the Absolute Speed Record for a straight flight, all show what British aircraft can, and will, do when given the chance.

Far more important to engine manufacturers are records established in the workshop and in day-to-day development testing. For example, de Havillands recently subjected a "Goblin" turbojet to a seven-week ordeal of all-day running, corresponding to a dozen wartime combat flights daily at 10 min. intervals, and representing eight flights round the world at jet-fighter speed, but with the gruelling fluctuations of the dog-fight. The "Goblin" made 462 starts, 2,772 rapid accelerations, a total of 50 hrs. at full combat power, 39½ hrs. at maximum climbing power and 269½ hrs. at maximum cruising output. After all that, without the slightest adjustment, the "Goblin's" performance would still have passed Royal Air Force acceptance tests for a new engine—an unparalleled example of reliability and sturdiness. Even more significant, maintenance time on the "Goblin" during a run of about 500 hrs. was only 13 hrs. The R.A.F. figure for maintenance on a piston engine during 500 hrs. of flight is 1,286 hrs. Equally good results have been achieved with the Bristol "Theseus" and Armstrong-Siddeley "Mamba" propjets.

Successful tests of this nature represent achievements of the greatest importance, for it is no use having the world's most



**Vickers "Viscount," the first propjet air liner. Photograph by courtesy of Vickers-Armstrongs Ltd.**



**Vickers "Nene-Viking," the first all-jet air liner. Photograph by courtesy of "Flight."**

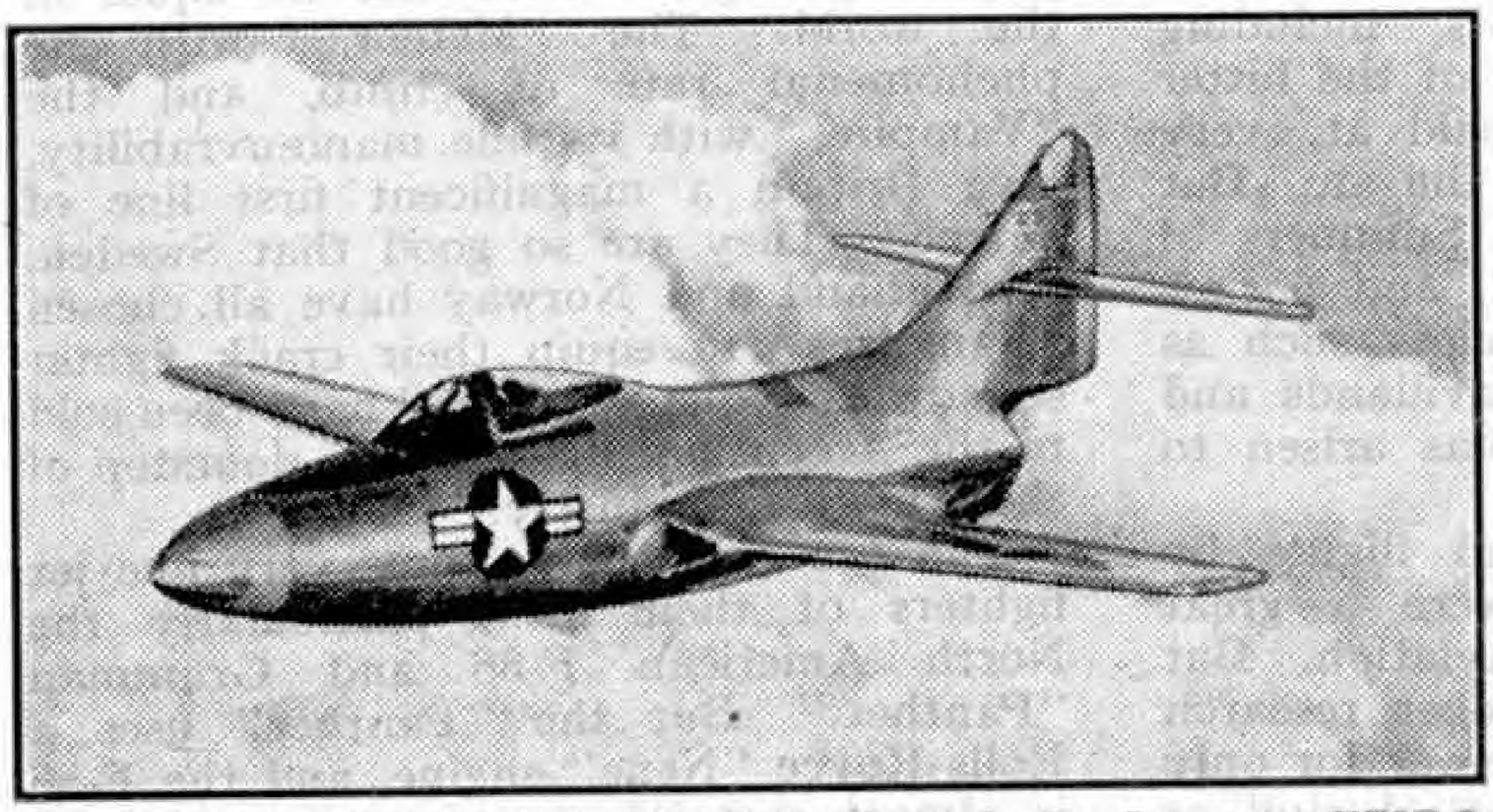
powerful engines or finest aircraft if they spend most of their service life grounded through unserviceability. British jets have always been able to run longer between overhauls than their foreign counterparts, and the large de Havilland "Ghost" turbojet has already been approved by the Air Registration Board as being completely reliable and suitable for civil passenger-carrying.

This superiority is not altogether surprising, for de Havilland products have earned a great reputation for reliability over the last 33 years, while the name of Rolls-Royce is synonymous with excellence throughout the world. Similarly Bristols, Armstrong-Siddeley, Napier and Metropolitan-Vickers are no newcomers to high-powered engine design. That the quality of British jet engines is well appreciated is shown by the fact that Rolls-Royce engines have been exported to France, China, Russia, America, and the Argentine, while de Havilland "jets" are being manufactured in Sweden to power the latest Swedish jet fighters.

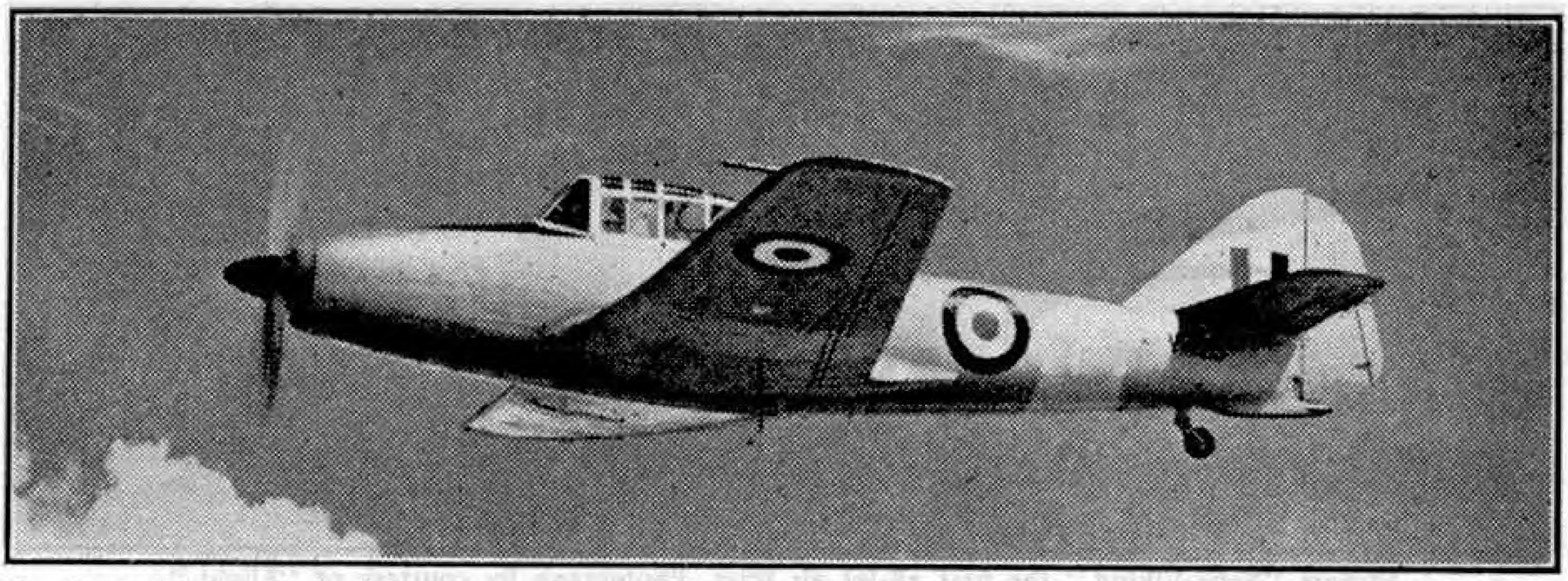
The sale of Rolls-Royce "Nenes" to Russia has been the subject of a great deal of criticism lately. But the transaction took place before international relations took a turn for the worse, and anyway, if British designers are selling "Nenes," "Goblins" and "Ghosts" abroad, it can be taken for granted that they have something better up their sleeves. One of the "something betters" is the powerful new Rolls-Royce "Avon," but little may be said about this engine at present. It is certain, however, that British designers intend to maintain their lead.

Of course, nobody outside Russia knows just how advanced are Russia's own home-produced "jets," developed with the help of some of Germany's leading engineers and scientists. We do know that the Red Air Fleet has had squadrons of jet fighters and jet bombers in service for at least 18 months, of which one fighter, believed to be a twin-jet MIG design, and a four-jet Ilyushin bomber, are quite advanced in design. But Russian aero engines have never been noted for high-power efficiency, and there is no reason to believe that her warplanes are any better than, or even as good as, the latest British and American types.

As a matter of fact, British engine manufacturers in the last two or three years have been developing jet engines so quickly and with such success that they have often found themselves without suitable airframes in which to flight-test their latest products. This is a complete reversal of the situation during the war, when airframe designers were always



**Another "Nene"-engined aircraft, shown here, is the Grumman XF9F-2 "Panther," the U.S. Navy's finest jet fighter. Photograph by courtesy of Grumman Aircraft Engineering Corporation, U.S.A.**



**The Avro "Athena" propjet trainer aircraft in the air. Photograph by courtesy of A. V. Roe and Co. Ltd.**

asking for more power to increase the speed and load-carrying capacity of their warplanes.

An early example of the changeover occurred when the Gloster "Meteor" set up its magnificent World Speed Record in 1945, using only 88 per cent. of the power of its two "Derwent" engines, as the airframe was not at that time strong enough to make use of the full power. Since then all sorts of unusual methods have been adopted to flight-test new engines, resulting in some weird and wonderful "spotter's headaches." Engines have been carried under a "Halifax," in the nose of 5-engined "Lancasters," sticking out from the tails of "Wellingtons" and "Lancasters," and replacing piston engines on "Lancs," "Halifaxes" and a "Viking."

While all this has been going on, airframe designers have been busy trying to catch up. Chief problem has been to overcome compressibility shock wave troubles at high speeds, and research into the effects of these shock waves at and below the speed of sound has cost the lives of some of the world's finest pilots, including Geoffrey de Havilland—part of the bitter price that has had to be paid at every stage of man's conquest of the air. But the old hands like "Mutt" Summers of Vickers have never faltered, and a new generation of magnificent pilots such as John Cunningham of de Havillands and Trevor Wade of Hawkers has arisen to carry on the challenge.

The first faster-than-sound flights by the American Bell X–1 were a great achievement for American aviation. But they were made with a rocket research aircraft able to fly at full power for only 2½ min., and not by a practical civil or military aircraft. Our policy in this country has been to develop our aircraft step by step, amassing as much aerodynamic data as possible before progressing further. The partially-completed Miles supersonic research aircraft was abandoned because it was considered unreasonable to ask any pilot to attempt such a venture into the unknown, and, for a long time, our supersonic programme was carried out with pilotless missiles, with mediocre success. This policy came in for much criticism, especially after the Americans "beat us to it"; but few people would have dared to say that it was wrong. Recently the little de Havilland 108 exceeded the speed of sound in a dive, an important advance for, although it is a research machine, it is a practical aeroplane able to take off under its own power and fly for reasonable distances. One day, perhaps soon, other British aeroplanes will fly faster than sound, and they too will be real aeroplanes, able to do a job of work, for we are gradually gaining the knowledge to make this possible.

Meanwhile, how are we using this knowledge? To begin with, the R.A.F.'s present jet-fighter team has no equal in the world. The "Meteor," with its phenomenal rate of climb, and the "Vampire," with its fine manœuvrability, give Britain a magnificent first line of defence. They are so good that Sweden, Switzerland and Norway have all chosen "Vampires" to equip their crack fighter squadrons, while "Meteors" have been sold to the Argentine, right on the doorstep of the American industry.

The Americans have some very fine jet fighters of their own, particularly the North American F-86 and Grumman "Panther." But the "Panther" uses a Rolls-Royce "Nene" engine, and the F-86 is almost certainly not such a good all-round proposition as Britain's new Hawker N7/46 naval jet (*Continued on page 409*)

# G.N.R.(I) Express Trains

THE express train services of the G.N.R.(I) between Belfast and Dublin have long had a special reputation. The most notable development in recent times has been the introduction of regular non-stop running in 2¼ hours, and one of the trains concerned in this appropriately named *"Enterprise"* service is shown on the striking cover to this issue. This has been prepared from a photograph by J. M. Holmes, Belfast, with the approval and help of the G.N.R.(I) authorities.

The *"Enterprise"* service began on 11th August 1947 with a train a day in each direction. It proved an immediate success, so that it was decided earlier this year to expand it to two trains a day each way. Thus, in addition to the original *"Enterprise"* leaving Belfast at 10.30 a.m. and returning from Dublin at 5.30 p.m., there are now corresponding departures from Dublin at 11.0 a.m., and from Belfast at 4.45 in the evening. The running times are the same, an average speed of just 50 m.p.h. being required to cover the 112½-mile journey in 2¼ hours. As these trains are non-stop between the capital cities of Northern Ireland and Eire, the Customs examinations normally made at Goraghwood and Dundalk are carried out at the terminal stations.

With its seven-coach formation, an *"Enterprise"* train headed by one of the large 4–4–0 compounds of Class "V" makes a fine sight. These engines were originally introduced in connection with accelerated services in 1932, when an allowance of 2 hr. 20 min. with three stops became the best timing. The best start-to-stop run was then made at 60.3 m.p.h. Unfortunately these timings had to be eased out slightly, but even so the best start-to-stop speed in 1939 was 57.6 m.p.h. from Dublin to Drogheda.

Our cover picture and the accompanying photograph are of special interest in showing No. 84 *"Falcon"* as now running with a Belpaire fire-box in place of the original round-topped pattern. This alteration has added to the already massive appearance of the type. In the smart blue livery adopted for the more recent G.N.R. passenger engines the "V" Class compounds look well, and when on the *"Enterprise"* service additional distinction is given by the informative destination and train name-boards carried at the front end.

As we write this we have news of further developments in Great Northern motive power. A 3-cylinder simple version of the same general 4–4–0 design has been prepared and the five engines of the new series, Nos. 206–210, have recently been delivered. Even with outside steam pipes and Walschaerts valve motion, the traditional G.N.R. outline is preserved. The new design provides the only instance for some years of the building of 4–4–0s for important main line express work, and it incorporates a Belpaire fire-box. We illustrate and describe one of these new engines on page 379 of this issue. It will be interesting to compare the running of the new simple engine with the compound type.

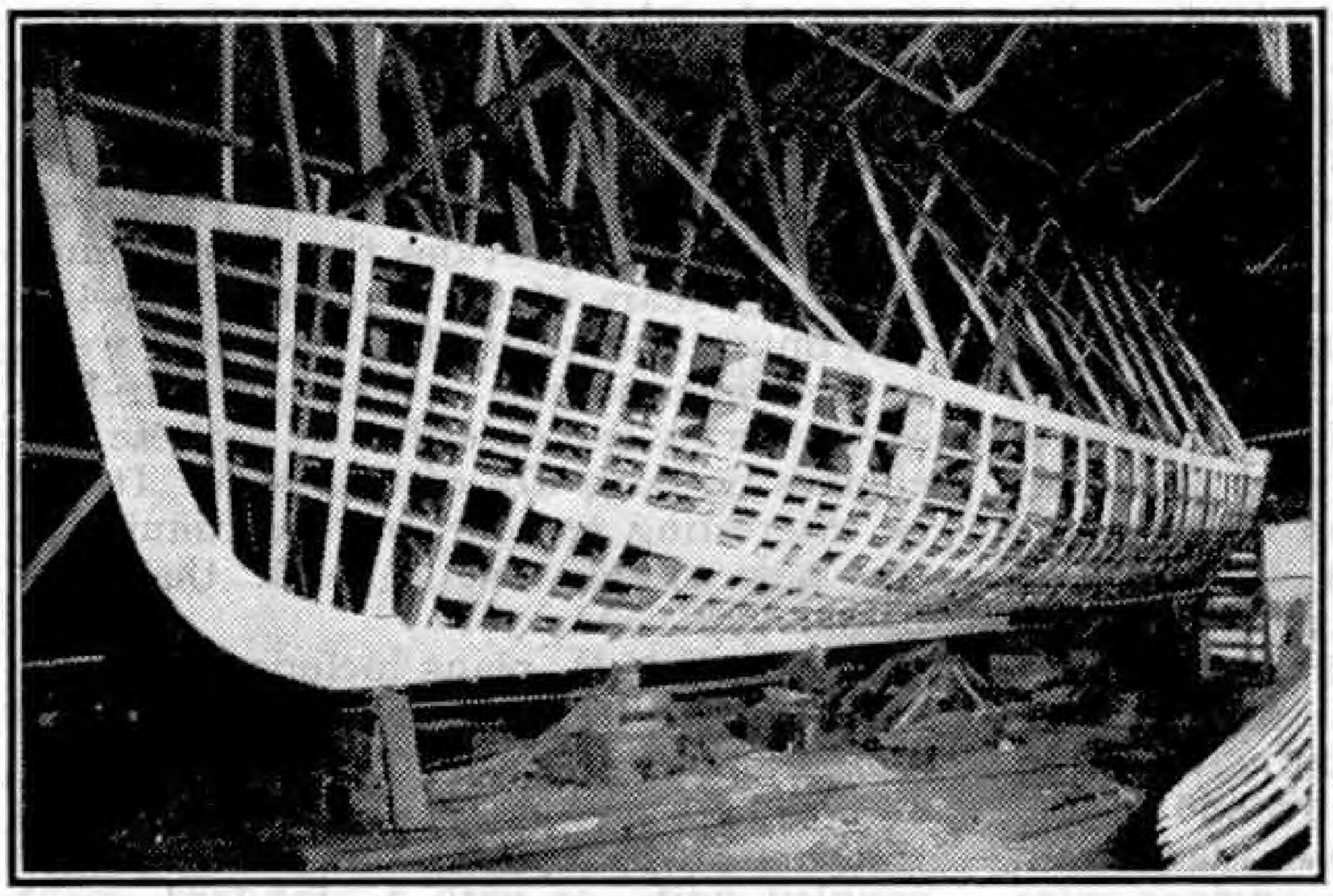
Future G.N.R. plans include an hourly express service between Belfast and Dublin. This will be provided by A.E.C. oil-engined vehicles of the railcar type, which will be operated either as twin-coupled units or with a standard coach interposed between them.


**G.N.R.(I) compound No. 84 "Falcon" fitted with Belpaire fire-box and displaying "Enterprise" nameboards. Photograph by courtesy of the G.N.R.(I).**

# The Building of a Life-Boat

## A Marvel of Efficiency

IN order to make up for the losses and delays during the war the Royal National Life-Boat Institution decided, as soon as the war ended, to lay down 80 new life-boats. Since the end of the war it has built and sent to the coast nine. Seven of these are of the 46 ft. 9 in. Watson Cabin type, one is of the 35 ft. 6 in. self-righting type, and the other of the 35 ft. 6 in. Liverpool type. In addition 27 boats are under construction or shortly to be laid down.



**A life-boat under construction. This view shows the framework of the boat seen from the bow end. The illustrations to this article are by courtesy of the Royal National Life-Boat Institution.**

Before the war only the larger boats had two engines and twin screws; now all boats are having them, and the need to carry sails will be gone. Up to the present only the larger boats have had diesel engines. It is hoped that in the future all boats will have this type of engine, and will use heavy oil instead of petrol. This will double the distance that life-boats can travel, and greatly reduce the risk of fire.

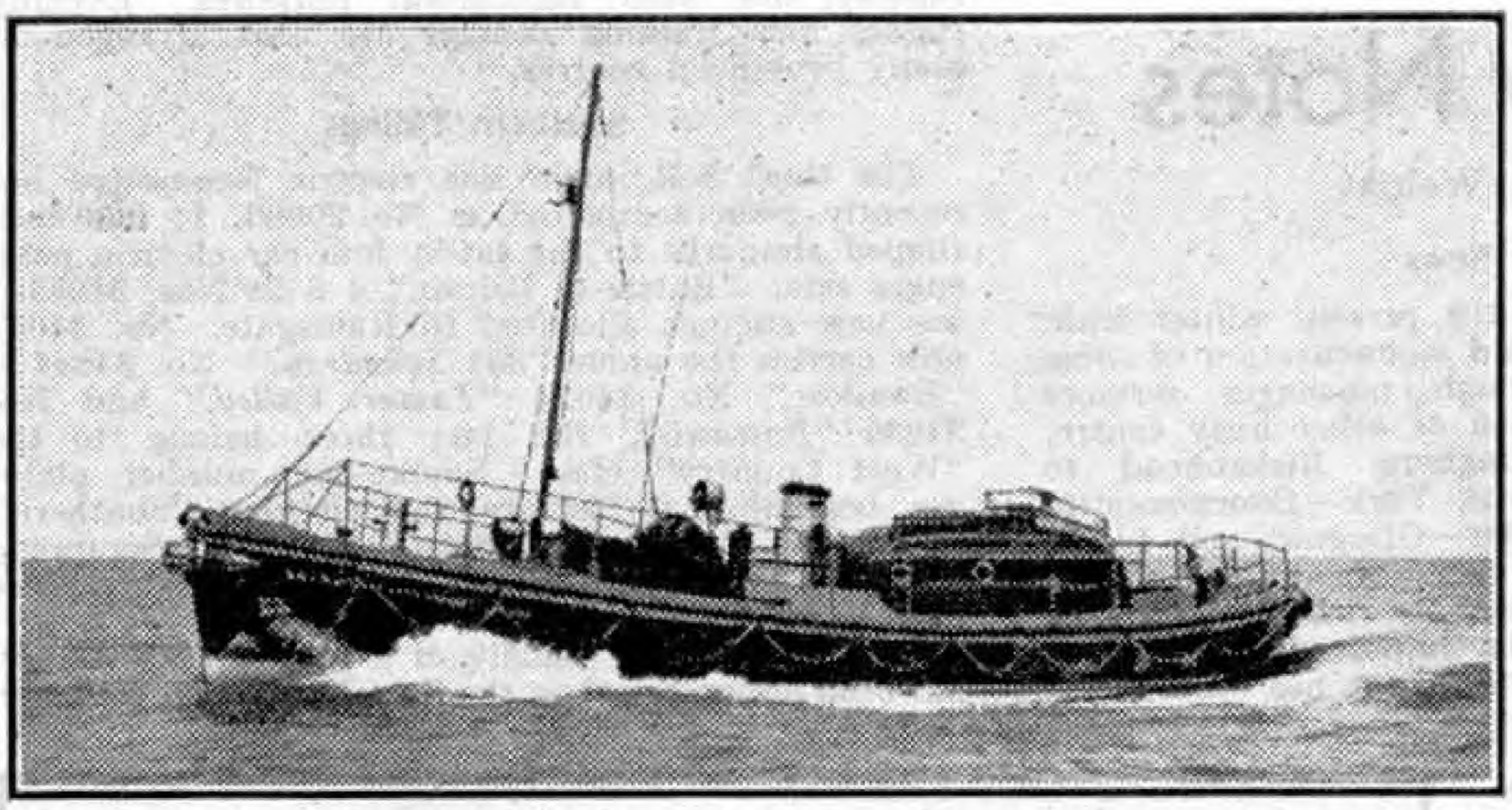
The great difficulty in using wireless in life-boats hitherto has been to protect the apparatus from the sea, and only life-boats with cabins have been able to carry it. Now all new life-boats, whether they have cabins or not, will be fitted with radio telephony receiving and transmitting sets.

The standard type of life-boat is the 46 ft. 9 in. by 12 ft. 9 in. Watson cabin type. On service, with crew and gear on board, she weighs approximately 20 tons. She has twin screws and is driven by two 40 h.p. diesel engines. The engine-room is a water-tight compartment and each engine is itself water-tight. Her speed is 8¼ knots, and she carries fuel sufficient for 200 miles at full speed. She has a crew of eight and can take 95 people on board.

Various kinds of wood are used in her construction, including Burmese teak, African mahogany and English oak, and the accompanying illustration showing the framework of the boat from the bow gives a good idea of the method of construction. The object aimed at, at every stage, is the utmost strength and reliability. Buoyancy is, of course, of the first importance, and therefore the boat is divided into eight water-tight compartments. When the bulkheads forming these compartments have been completed, each compartment is filled with water to test the complete water-tightness of all the bulkheads and skin planking.

Air cases, of which there are from 140 to 190, are fitted into the forehold, wing compartments and aft hold. These cases are made of Western Red Cedar and covered with calico laid on marine glue. The cases are all made in the boat so that each one will fit exactly the part of the hull where it will be placed, and no two are the same. Each case is subject to a rigid test to prove its water-tightness, because, if at any time the skin planking should be holed, the buoyancy to keep the boat afloat is provided by these cases.

The boat has two engines of the four-stroke compression-ignition type with overhead valves. Each engine develops 40 s.h.p. at 1,200 r.p.m. and has four cylinders with a bore of 4¼ in. and a stroke of 6 in. The reverse gear is of the sun-and-planet spur type giving 4/5ths



**The life-boat now named "William Gammon—Manchester and District XXX" which went to "The Mumbles" last year to replace the boat wrecked there in April.**

of the ahead speed astern, and aft of this gear is an unusual form of reduction gear that halves the engine speed for the propeller. Three methods of starting each engine are provided—direct hand turning; hand gear in which a flywheel is given a spin at high speed and then clutched in to the crankshaft; and an electric motor. Combustion chambers in these engines are of the open type and fuel injection is by C.A.V. pumps and atomisers. Very great care is taken to eliminate any risk of a choked atomiser.

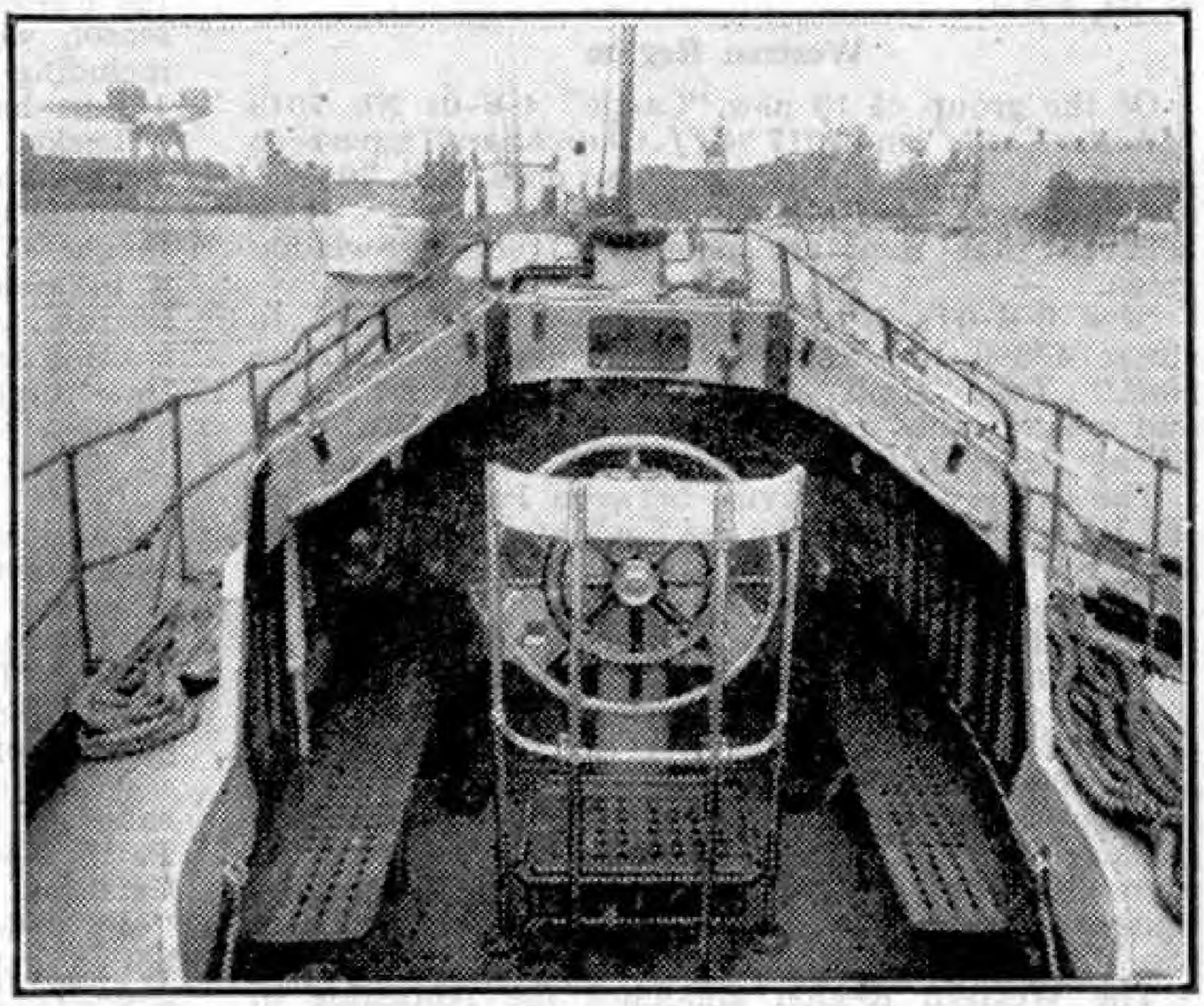
An important item bearing on reliability is lubrication, which is supplied under pressure throughout the engine, the reverse gear and the reduction gear. A dry sump system is used, oil being drawn from the lowest points and pumped into tanks on the bulkhead for supply to the pumps which deliver oil under pressure to the bearings. Fresh water is used for cooling the cylinder jackets, heads and the exhaust manifold, the fresh water being cooled in tubes round which sea water is circulated. Enough fuel oil is carried in a large tank for each engine for a voyage of 200 nautical miles; it is pumped to the engine by both mechanical and electrical means.

Each engine forms an entirely independent unit. It is not only waterproof, but actually submersible, and will continue running when the engine-room is waterlogged.

The equipment of this type of life-boat includes a line-throwing gun; an oil-spray or wave-subduer, fixed either in the bows or amidships, in the form of a semi-rotary pump which can spray fish oil through nozzles; a portable double-acting hand pump for clearing of water compartments that are not served by the engine bilge pumps; a drogue or sea anchor with 20 fathoms of rope and tripping line; a capstan forward which is driven off the starboard engine and controlled by a foot pedal on deck; a fresh water tank holding 10 gallons; a first aid outfit; emergency provisions consisting of one tin of biscuits, one tin of chocolate, tins of self-heating soup and cocoa, and a bottle of rum. The boat is equipped also with receiving and transmitting radio telephony sets, and with a loud hailer.

The wireless and loud hailer are so arranged that the motor mechanic, sitting on deck under his canopy at his engine controls, is able to talk to the shore through the wireless and then, simply by pressing a switch, to pass to talking direct to the wreck through the loud hailer.

This life-boat has not a great speed, just over ten knots, but an immense reserve of power, so that she can maintain her speed in almost any weather.



**A view of the steering wheel, cockpit and instrument panel.**

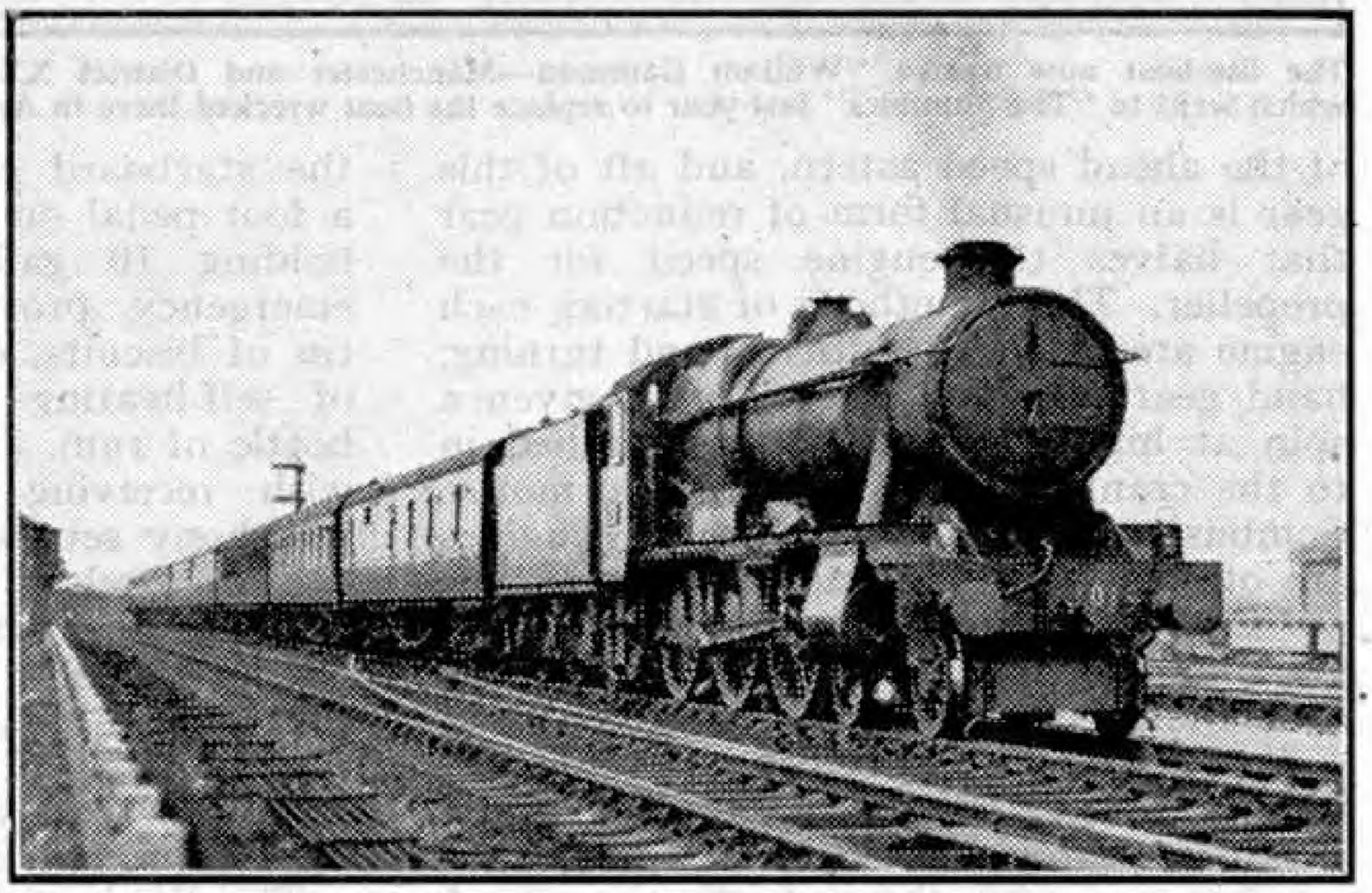
# Railway Notes

By R. A. H. Weight

### National News

An important feature of the present winter train services is the restoration and augmentation of some of the cross-country through passenger services avoiding a change in London or other busy centre, such as Newcastle—Birmingham; Birkenhead to Kent and Sussex coast towns; York—Bournemouth; Cardiff—Brighton; Manchester—Glasgow; and Liverpool—Colchester. There are corresponding through trains in the opposite directions, usually provided with restaurant cars, serving important stations or junctions on the way. Steam heating has been generally restored for the winter months.

In consequence of the disastrous flood damage that occurred towards the end of August last, the main East Coast route was still closed at the time of writing to all traffic for a considerable distance in Southern Scotland north of Berwick-on-Tweed. Good progress was being made however with repairs to bridges, culverts, embankments and tracks, by dint of combined operations organised by military, contractors' and railway engineers. Meanwhile the branch lines between St. Boswells, Kelso and Tweedmouth, which connect the "Waverley" (Edinburgh—Carlisle) and East Coast main routes, have been carrying Anglo-Scottish expresses hauled by "Pacific" or other heavy engines, with an unavoidable increase in overall times to the extent of 1 hr. or more. Diversion on to parts of the former L.M.S. main line also took place to a considerable extent, particularly when the damage was at its worst.



**Western Region up Bristol line express leaving Reading. The engine is 4-6-0 No. 1014 "County of Glamorgan." Photograph by M. W. Earley, Reading.**

### Western Region

Of the group of 10 new "Castle" 4–6–0s No. 7016 "*Chester Castle*" and 7017 "*G. J. Churchward*" have been placed in service. The two previous ones, Nos. 7014–5, are stationed at Bath Road, Bristol, shed. It is believed that they are painted standard Swindon green.

New 0–6–0Ts Nos. 7431–4, have been added to stock; 4–6–0 No. 6954 has been named "*Lotherton Hall.*" Two "Halls" painted black with red, grey and cream lining are Nos. 5954 and 6910. No. 6025 "*King Henry III*" has been noted in dark blue.

The express train service between Paddington and the West of England via the Lavington—Castle Cary short route has been generously augmented compared with recent winter seasons.

Chepstow bridge spanning the River Wye is the largest on the old main line from Gloucester to Newport. It was designed by Brunel in 1852 and consists of a 300 ft. tubular span over the river itself, with three 100 ft. land spans on the Chepstow side. The wrought iron construction of the latter has just been replaced by 600 tons of modern steel girderwork. Some 300 tons of steel trestling had to be erected under the bridge while work was in progress to support the new girders during placing and erection.

The Western Region announce the reopening of the signalling school at Paddington with its model railway, for staff instruction purposes. Evening classes and training courses are also arranged at many provincial centres.

### Southern Tidings

The third S.R. main line electric locomotive has recently been completed as No. 20003. It has ends shaped similarly to the latest four-car electric passenger sets. "Battle of Britain" 4–6–2s Nos. 34080–1 are new engines allocated to Ramsgate. No. 34071 now carries the name "601 *Squadron.*" No. 34034 is "*Honiton,*" No. 34024 "*Tamar Valley,*" and No. 34039 "*Boscastle*"; the last three belong to the "West Country" class. Smoke-box number plates are beginning to replace the circular "Southern" plaques on the front of latest "Pacifics." Scrapping of a good many withdrawn engines is taking place near Salisbury.

Passenger traffic, usually of a very scanty nature, has been discontinued on the East Kent Light Railway, but the Kent and East Sussex was quite busy as usual during hop-picking time. The special trains on the Eastern Section main or branch lines during that season were hauled mainly by Wainwright 4–4–0s, including rebuilds and "L" class, as the old Stirling 4–4–0s have almost disappeared from Kent.

Tucked away in wooded country not far from Battle and Hastings, near Robertsbridge, are the Mountfield Gypsum Mines, which provide a heavy freight train traffic. Gypsum, or calcium sulphate, is in great demand for the manufacture of plaster boards. A Stroudley "E1" class 0–6–0T on loan is often seen shunting wagons to and from the mines, thus supplementing the Gypsum Company's own engines.

### London Midland Regional News

Considerable interest is still being taken in the experimentally painted engines and rolling stock along the main lines of England and Scotland.

"Patriot" 4–6–0 No. 45506 has been ceremonially named "*The Royal Pioneer Corps.*" Reboilering and modifying to "6P" is continuing in the case of certain engines of this class.

New engines have been placed in service and allocated as follows:—Class "5" 4–6–0 No. 44701, 29A, Perth; Nos. 44702–3, 31A, St. Rollox; No. 44704, 28C, Carstairs; No. 44746 (roller bearings), 20A, Leeds; "4P" 2–6–4T No. 42161, 23D, Wigan; Nos. 42162–3, 28C, Carstairs; No. 42165, 27C, Hamilton; Class "2" 2–6–2T, No. 41210, 1C, Watford; No. 41211, 2C, Northampton; Nos. 41212–3, 7B, Bangor.

### New G.N.R.(I) 4-4-0s

The upper illustration on this page shows one of five new 4–4–0 express locomotives introduced by the G.N.R.(I) for main line Dublin–Belfast services, including the non-stop "*Enterprise*" trains. They have been built by Beyer, Peacock and Co. Ltd., Manchester, to the designs of Mr. H. R. McIntosh, Mechanical Engineer of the G.N.R.

The new engines are Nos. 206—210, and are named in that order "*Liffey*," "*Boyne*," "*Lagan*," "*Foyle*," and "*Erne*." They are the first 3-cylinder simples on the G.N.R. and each cylinder has its own set of Walschaerts valve motion. The boiler, which has a Belpaire fire-box, and various other parts are interchangeable with those fitted to the existing 4–4–0 Glover compounds. The working pressure is 220 lb. per sq. in. and the tractive effort at 85 per cent. of this is 21,469 lb. The smoke-box is of the self-cleaning type, with spark arrester, while the rocking grate and hopper ash-pan facilitate fire-cleaning and disposal work.


**G.N.R.(I) No. 209 "Foyle" of the new 3-cylinder 4-4-0 class referred to on this page. Photograph and details are by courtesy of the G.N.R.(I).**

The tender has roller bearing axle boxes and is of the high-sided type developed on the G.N.R., carrying 6 tons of coal and 4,000 gallons of water. The total weight of engine and tender in working order is 110 tons, of which the engine's weight alone is 66 tons 6 cwt.

### Eastern and North Eastern Regions

A fine photograph is reproduced this month of No. 60114, the first of the new "A1" class of 4–6–2 express engines. More are being built at both Doncaster and Darlington Works, the series numbers starting at 60114 and 60130 respectively. They are high-speed engines, but not streamlined. Driving wheels are 6 ft. 8 in. in diameter and the three cylinders are 19 in. in diam. with 26 in. stroke. Fittings include double chimney, electric light, rocking grate and Flaman speed recorder. The boiler and large fire-box with 250 lb. per sq. in. working pressure are the same as those of Mr. Peppercorn's latest "A2" type.

A record for its class has been set up by Eastern Region "B1" 4–6–0 No. 1058 (L.N.E.R. numbering), shedded at Ipswich, by running 111,000 miles before visiting works for general overhaul. The engine's mechanical condition was still good. Building orders for this useful class have just been completed, No. 61339 being the 340th "B1." More will follow.

Scientific aids to effective locomotive repair work at Gorton, near Manchester, include an industrial X-Ray plant that reveals hidden weaknesses in metal components that are curable by welding, so saving for further use fire-boxes or boilers that might otherwise have been scrapped. Polarised light apparatus that determines stresses or strains in metal also is being used.

The Royal blue "A4" No. 60027 "*Merlin*," which is stationed at Haymarket, Edinburgh, and shared last summer in the working of the non-stop "*Flying Scotsman*," carries on the side sheeting neat blue plaques with the name over a picture of the bird, symbolising the association between the locomotive, the bird, and the famous Rolls-Royce 'plane engine known by the same name.

Further withdrawals include former G.C.R. 4–6–0s, G.N. and N.E. 4–4–2s and G.N. and G.N.S. 4–4–0s. As regards tank engines, a start has been made of condemning one or two 0–4–4s of the "G5" type, a large and hard-working N.E.R. class that has consisted of 110 locomotives for nearly 50 years. Class "N12" (Hull and Barnsley 0–6–2T) is now extinct.

We are informed that a "B12/3" rebuilt ex-G.E.R. 4–6–0 has been running on the M. and G.N. Joint line, and that the 5.25 p.m. fast fish train from Tynemouth to King's Cross has been hauled by a remarkable variety of locomotive types, including Eastern Region "Pacifics" returning south to home sheds. The present winter rosters provide for an increased number of through engine workings between London and York or beyond.

**Eastern Region "A1" 4-6-2 No. 60114, the latest Doncaster "Pacific" for express work, on the 5.50 p.m. King's Cross-Hull train. Photograph by E. R. Wethersett, Hounslow.**

# The Big Wheel of Laxey

By George V. Gould

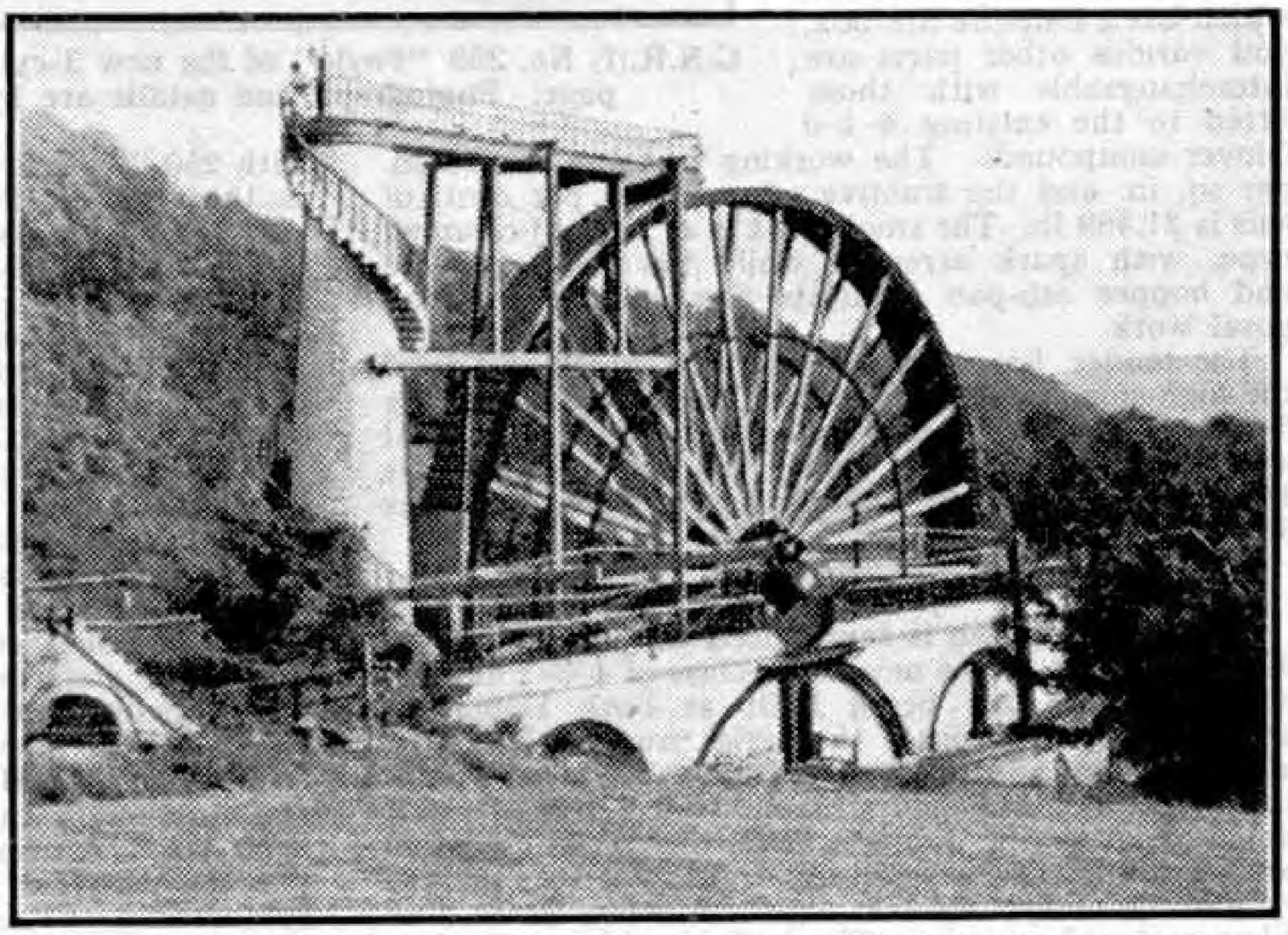
THE small village of Laxey is on the east coast of the Isle of Man, about six miles from Douglas. This hardly seems the place to look for an example of engineering skill, yet there stands the Big Wheel of Laxey, one of the most interesting structures in Europe.

This huge waterwheel, which when built was the largest in the world, was designed and constructed by Robert Casement, engineer at the lead mines near by. These mines were sunk to a depth of nearly 2,000 ft. and in the 1850s much trouble was experienced by water seeping through into the workings and so causing flooding. It was to combat this that the Big Wheel was designed. The wheel pumped out 100 gallons of flood water every revolution and completed 2½ revolutions a minute; yet it is operated from a small tank further up the valley, only 2 ft. higher than the top of the wheel itself. The water from the tank is taken through pipes to the base of the wheel and is then siphoned up the stone tower, which is 72 ft. high, to fall into the buckets of the wheel. There are 192 of these, spaced evenly round the wheel's circumference of 228 ft., and each holds 20 gallons of water.

The wheel itself is constructed of timber and has a cast iron rim. It revolves around a malleable iron axle 17 ft. long, and 1 ft. 9 in. in diameter. The whole wheel is estimated to weigh about 100 tons. The base upon which it rests, as well as the tower and the row of arches, were all constructed from stone quarried from a site near by. The row of arches originally carried the rod that connected the crank on the wheel's axle to the pump at the lead mine shaft some 200 yds. away, but now only the first carriage at the wheel end remains connected, as the mines are no longer in use.

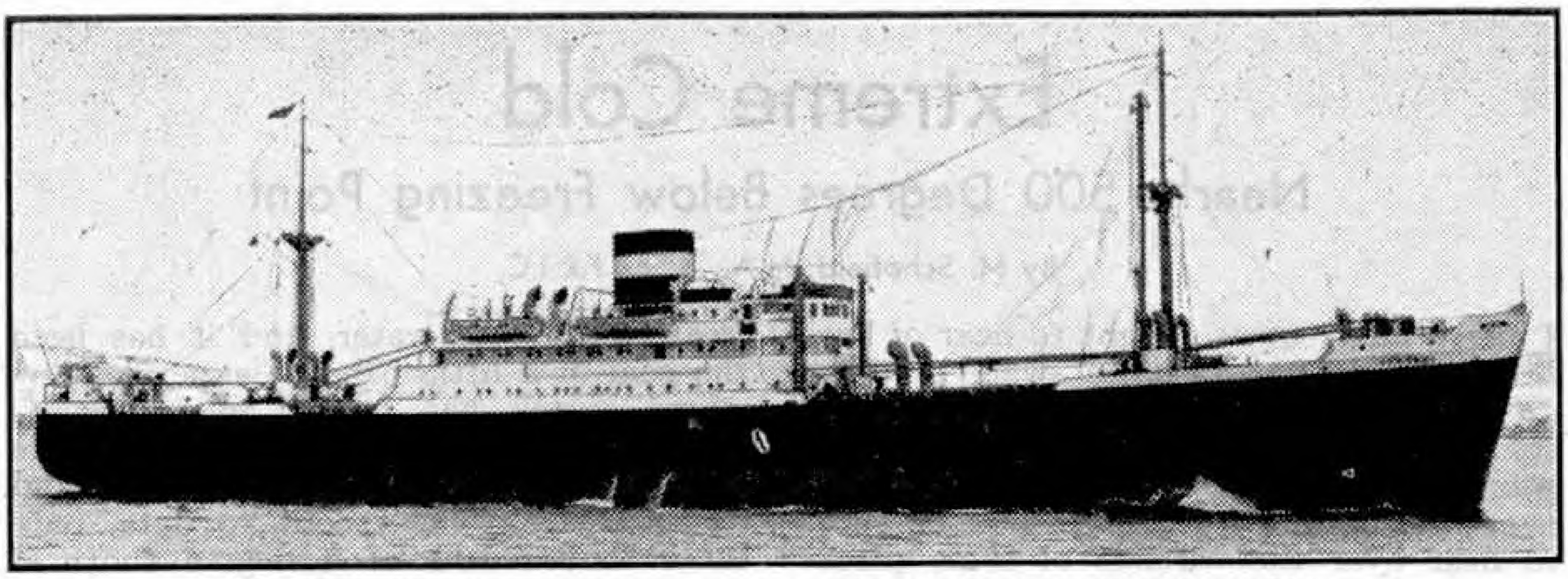
The wheel was first set in motion on 27th September 1854, and was christened the *"Lady Isabella"* in honour of the wife of the Governor of the Island. A great fete was held on this day and the valve controlling the flow of water to start the wheel was opened by Sir Charles Hope, the Governor. At the same time a bottle of champagne was used to christen the wheel, and a flag bearing its name flown from a mast at the top.

The lead mines ceased to pay some years ago and then the wheel was no longer needed. It was kept running for some time as an attraction for the Isle of Man's holiday visitors, but finally was allowed to fall into disrepair. Then, just before the war, the giant wheel was completely renovated and repainted and now can turn as majestically as ever.



**Visitors descending from the top of the tower of the Big Wheel of Laxey, in the Isle of Man.**

The *"Lady Isabella"* stands as a tribute to the ingenuity and skill of Robert Casement, and so well made and balanced is it that even after nearly a century it still turns in almost complete silence, the only noise to be heard being the roar of the water as it falls from the buckets at the base. The structure is open to visitors, who may climb the 96 steps around the spiral staircase to the top of the tower and walk along the platform until they are over the wheel itself. From there the line of arches can be seen stretching away to the old lead mine buildings in the near distance.



M.V. "Kantara," one of two new cargo ships for the Moss Hutchinson Line.

# Interesting Belfast Ships

By Denis Rebbeck, M.A., M.Sc., B.Litt., M.I.N.A.

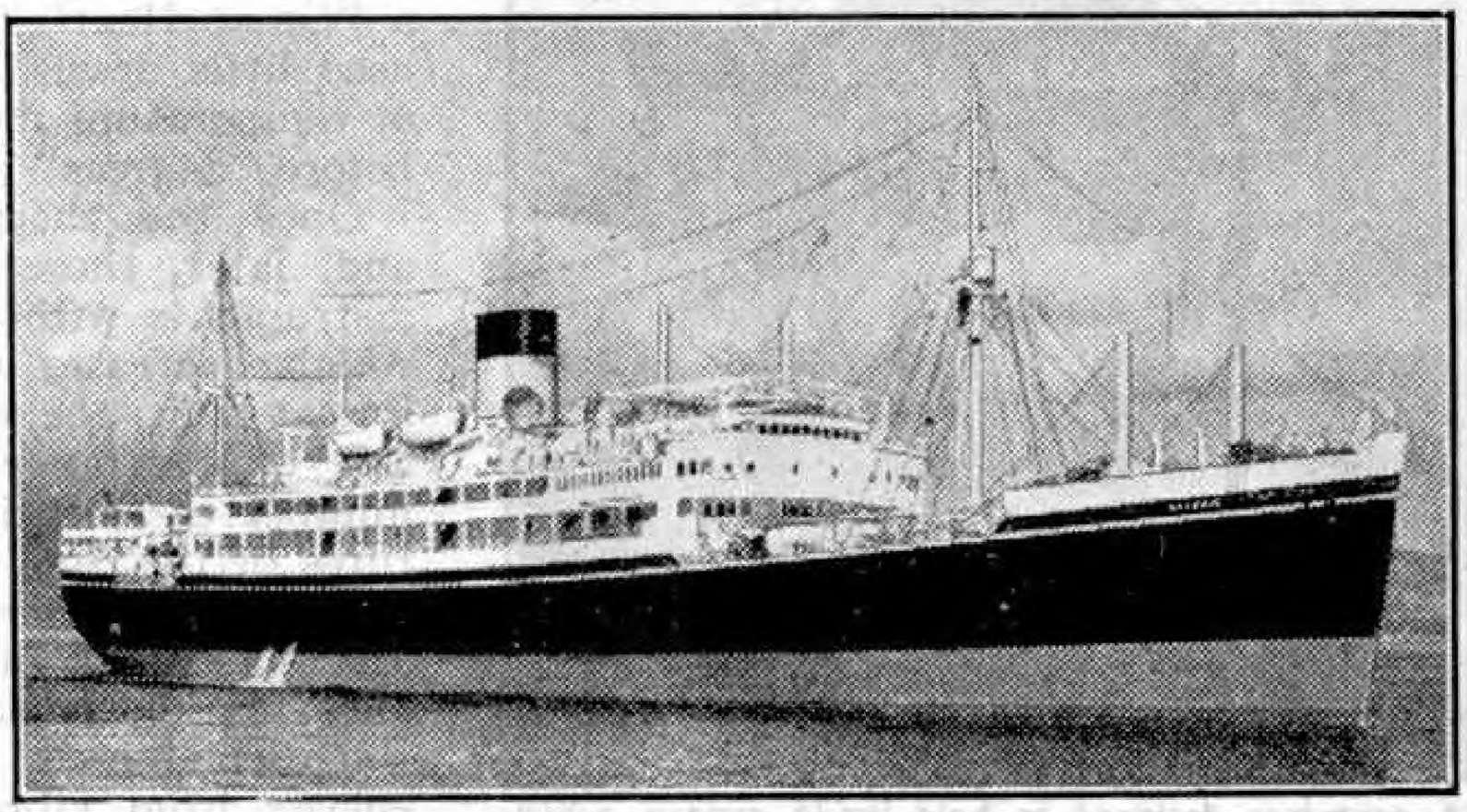
THE Moss Hutchinson Line have recently taken delivery of two splendid cargo vessels from the Belfast shipyards of Harland and Wolff Ltd. These are the M.V. *"Kantara,"* shown above, and her sister ship the *"Karnak,"* and they have been specially designed for fruit and general cargo trade in the Mediterranean. They are of the single screw Shelter Deck type, length overall 367 ft., breadth moulded 52 ft., depth moulded to the shelter deck 32 ft. 6 in., and gross tonnage 3,350. There are four cargo holds, and the cargo handling equipment consists of 11 tubular steel derricks operated by electric winches.

The propelling machinery consists of a single-acting four-cycle, cross-head, Harland-B. and W. diesel engine. There are six cylinders of 650 mm. bore and 1,400 mm. stroke arranged for under-piston pressure induction.

The s.s. *"Athenic,"* which was built by Harland and Wolff Ltd. at their Belfast shipyards, and handed over last year, is the second of the first four first-class passenger and cargo liners ordered by the Shaw Savill and Albion Co. Ltd. since the war. The new liner was designed for service on any of the routes covered by the Shaw Savill Line between England and South Africa, Australia and New Zealand. There is accommodation for eighty five first-class passengers.

The *"Athenic,"* which has a gross tonnage of 15,000 and a normal service speed of 17 knots, is powered by two sets of geared steam turbines. Steam is supplied by two high-pressure water-tube Yarrow boilers, oil fired on the Wallsend-Howden patent pressure system, and having a working pressure of 425 lb. per sq. in. The vessel can carry over 7,000 tons of refrigerated cargo in addition to 4,000 tons of general cargo. Five of the six holds are insulated and the derricks have a lifting capacity of 7 and 12 tons.

Her overall length is 561 ft., length between perpendiculars 530 ft., moulded breadth 71 ft., and depth to the shelter deck 43 ft. 4½ in. The total refrigerated cargo capacity is 529,000 cu. ft.



S.S. "Athenic," a new first-class passenger and cargo liner for the Shaw Savill Line.

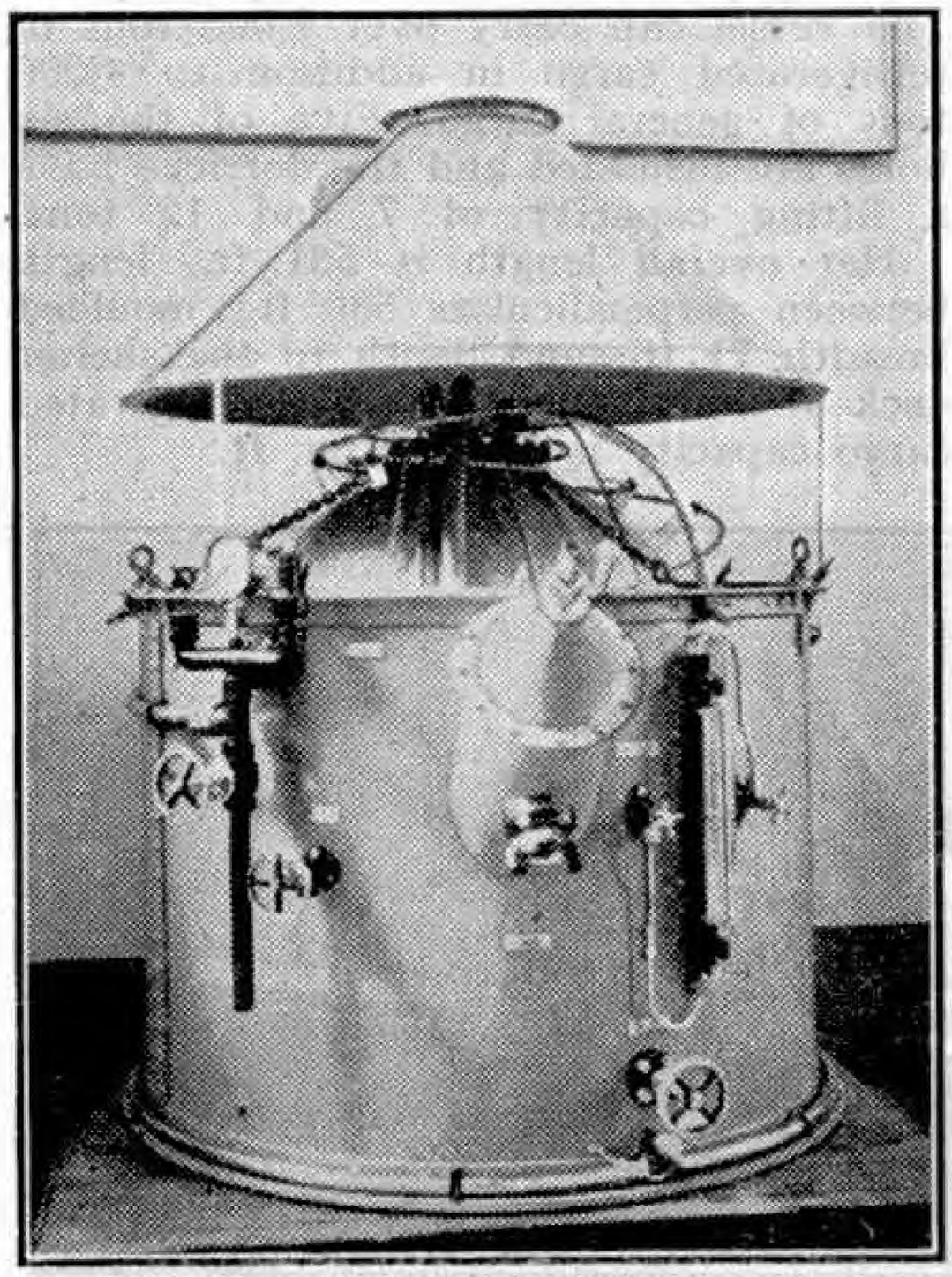
# Extreme Cold

## Nearly 500 Degrees Below Freezing Point

By M. Schofield, M.A., B.Sc., F.R.I.C.

HOW many of us delight to hear of low temperature records, even if they are only degrees of frost! If an exceptional cold spell does come along, with less hardy people muffled up to the ears and grumbling over the "killing frost," we shall be sure to hear over the wireless of some place much colder. We may hear, for example, of some place beating Oi-Mekon in Eastern Siberia, claimed to be the coldest place in the world, where a bucketful of water thrown out does not splash, but breaks, since it freezes before hitting the ground.

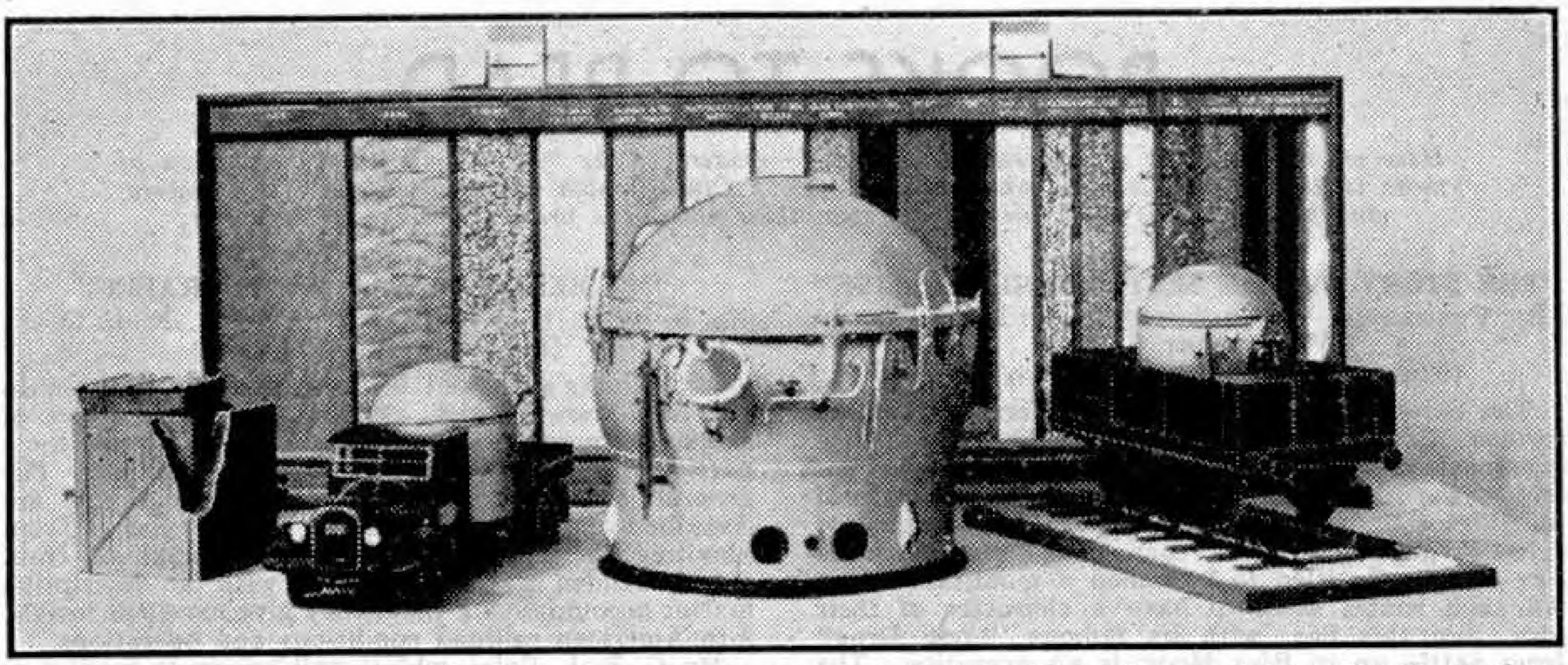
And yet Oi-Mekon's record of minus 102 deg. does not sound so exciting to scientists in what are called "cryogenic" or low-temperature laboratories, like those in Oxford and Leyden where they dabble in very low temperatures indeed. The search to attain the extreme limits of cold, the Absolute Zero of temperature, has proved one of the most fascinating problems of the scientist. This temperature is minus 273 deg. C., or 491.4 deg. F. below the freezing-point of water, and it has been the goal of a little band of experimenters whose search has proved every bit as thrilling as those other low temperature expeditions to the summit of Everest and to the Poles. The record to date, only three thousandths of a degree short of the ultimate goal, has only been won after years of exhausting work in laboratories, work that was sometimes dangerous when explosions accompanied attempts to liquefy gases under enormous pressures as steps in the process of intense refrigeration.



**A container designed to hold liquid oxygen, which boils at -296.5 deg. F.**

First efforts to get below the freezing point of water were no more striking than the older methods of making ice cream. Freezing mixtures of ice and salt, then of ice and sal ammoniac, were used by men like Gabriel Fahrenheit, the inventor of the thermometer scale still used in Britain. This scale had its zero fixed by such mixtures, since it was imagined that no lower temperature would be reached. Its 100 deg. point was supposed to be blood heat, but Fahrenheit was not very accurate. Yet the first urge to get lower temperatures was started by those early thermometer makers and experimenters. Besides Fahrenheit there was Celsius, with his Centigrade scale devised by putting his mercury bulb first in snow and then in a metal teapot stood on a coal fire; Newton, who tried linseed oil in the bulb; and Von Guericke, who marked his "Great Cold" or "Magnum Frigus" with little angels pointing to it! If he had marked a "Great Heat" he would probably have used little devils. In any case some form of temperature measurer had to be made before "degrees" could be talked about.

Once the thermometer was perfected and, later, those more efficient electrical instruments with a wire the resistance of which decreases uniformly down to the lowest limit, the spell of low temperatures and their strange effects took hold of a number of scientists. The high temperatures of the Sun, the electric arc and the electric furnace were more easily attained and measured in thousands of degrees. But mathematicians soon told us that since cooling is simply extracting heat energy from vibrating particles or molecules of a body, a time must surely come



**Vacuum containers for very cold liquids. Behind them are panels of various insulating materials. The illustrations to this article are Science Museum photographs and are reproduced by courtesy of British Oxygen Co. Ltd.**

when such particles cease to vibrate at all, when no more heat can be extracted. That point must be the Absolute Zero. And the physics experts soon predicted it to be minus 273 deg. C.

But how to reach it! That was the problem. And if it should be passed by some experimenter, what would become of all those theories of the scientist? After refrigeration by ice and salt mixtures, there came the second step in the downward groping. Just as when water or petrol is poured on the hand one feels this becoming colder as evaporation takes away heat, so it was realised that a liquefied gas caused to evaporate by using a pumping engine would give much lower temperatures. Ammonia refrigerators and others using liquefied sulphur dioxide gas work on this idea. But in turn this evaporating liquid can form a cooling jacket around a second metal pipe, in which another gas could be liquefied under great pressure.

So with this "cascade" method the attack went on from first experiments at Leyden. The Frenchman Thilorier was the first to liquefy and then solidify the gas carbon dioxide, so well known in soda water and fizzy drinks. His steel apparatus blew up at times and he suffered severe injury, but he made that intensely cold "Dry Ice" or "Carbonic Snow" nearly 100 years before it was adopted in industry and by those "Stop-me-and-Buy-one" ice cream tricyclists.

Others who joined in the quest were Pictet, a Swiss engineer, two Polish chemists with the "wriggly" names of Wroblewski and Olszewski, and Sir James Dewar, who liquefied hydrogen. Two new weapons were brought into the attack, both of which proved master strokes. Dewar invented the well-known "thermos" or vacuum flask, a double-walled container with a vacuum between the two walls. His idea was to keep heat out rather than in, however, and his vacuum vessel proved ideal for storing the intensely cold liquefied gases. And when it was found that certain gases, on suddenly escaping from high pressure, cooled themselves; that on sending the cooler gas through the same operation again it became colder and colder, a method of obtaining not only liquid air but also liquid hydrogen and finally liquid helium was attained.

Early experimenters thought they had done well when a fine mist or a few drops of liquid air had been won, but Dewar was able to make it by the pint, and then prepare liquid and even solid hydrogen. And when helium had been liquefied and then finally solidified, it was not long before the lowest temperature, a very small fraction of a degree above Absolute Zero, was attained.

And the use of such low temperatures? Think of all those huge amounts of oxygen separated from air by liquefaction, oxygen for use in hospitals, for deep-sea divers, for mountaineers, for mine rescue parties, and for use in oxy-hydrogen and oxy-acetylene welding and metal cutting. So great is the amount used by some firms that large vacuum tanks have been installed and the oxygen is transported, not in batteries of heavy steel cylinders, but in vacuum tank lorries. The old liquid ammonia plants still turn out vast amounts of ice; the newer solid carbon dioxide is used more and more for preserving and refrigerating foodstuffs.

# BOOKS TO READ

*Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.*

### "THE STORY OF THE SETTLE-CARLISLE LINE"

By FREDERICK W. HOUGHTON, Grad.Inst.T., and W. HUBERT FOSTER
(Norman Arch Publications. 10/6 net)

The Settle-Carlisle line is the northern part of the former Midland Railway route to the Border. Its construction through the wild Pennine region was one of the most notable railway engineering feats of mid-Victorian times. At Ais Gill a summit level of 1,169 ft. above the sea is reached, and the line therefore is fully entitled to be called a mountain route. All such routes seem to have a character of their own, and this line, with its famous "Long Drag" from Settle up to Blea Moor, is no exception. The authors are thoroughly familiar with every inch of it and have succeeded in giving much of its special "atmosphere" to their story.

The reader is taken chapter by chapter through the inception of the line and its construction, and gains a real knowledge of the peculiar difficulties encountered and of the men who overcame them. The subsequent history of the route too is well covered. The various locomotives employed, a subject of special interest over such a route, and the coaching stock have special chapters, and there are excellent accounts of the general working of the line, the special features that its position creates, and the particular friendliness that exists between its railwaymen and their neighbours along the route.

The many illustrations are admirable; most of them are from photographs taken by Mr. Foster, who is a camera artist of high ability.

### "MORE ABOUT BRITISH WILD BIRDS"

By ERIC POCHIN (Beckhampton Press. 3/6 net)

This delightful volume is one of the "Young Naturalist" series, a continuation of the same author's "*How to Recognise British Wild Birds.*" It is delightfully printed, with many excellent bird pictures in colour, and describes 96 of the less common birds of Britain. These are grouped according to the type of country in which each is most likely to be found, and the illustrations and descriptions will allow the birds to be recognised easily. There are also comparisons of sizes and useful notes about nesting and general habits.

### "SHORT WAVE LISTENERS' ANNUAL"

(Amalgamated Short Wave Press. 3/6)

The 1948 edition of this annual is greatly increased in comparison with those of the two previous years. It contains the well-established features to which short wave enthusiasts look forward, giving details of call signs, amateur prefixes, station addresses, codes and information leading to the identification of short-wave stations, with accounts of the propagation of short wave radio. Among new features is the listing of the American Zone System now widely accepted in the amateur world. The volume can fairly claim to be a handy up-to-date reference book.

### "MODEL JET REACTION ENGINES"

By C. E. BOWDEN (Percival Marshall. 3/- net)

This is the era of the jet-propelled aeroplane, and aeromodellers are turning their attention increasingly to the construction of miniature aircraft having jet propulsion. They will find this handbook a valuable guide in this matter. The text is in two parts, the first of which explains the principles of jet reaction engines and describes the types that can be used for model work; the second describes model aircraft suitable for jet propulsion. The book is amply illustrated in line and half-tone.

### "MY BEST RAILWAY PHOTOGRAPHS"

No. 9, by R. H. KINDIG; No. 10. by C. R. L. COLES
(Ian Allan Ltd. 2/- each)

Mr. Kindig's booklet is an interesting addition to this well-known series, as it consists of a series of shots of American trains, chiefly in the West, by a particularly keen and skilled camera artist. The general conditions attending his photography are described in an entertaining manner as "Train Shooting in the Rockies." The selection of train views included is remarkable, and with the descriptive matter accompanying them they give excellent insight into American railroad conditions and operations.

Mr. C. R. L. Coles, who is well known to readers of "*Railway Notes*," likes something unusual for his railway photographs, and as a result many of the reproductions in No. 10 of these booklets are not merely train pictures. They show familiar subjects that railway working in general provides in addition to trains, including scenes in the shops, special operations, or rare classes of engines. In an introduction the author describes his approach to the subject and his methods, and the usual details are given of equipment and exposure.

Copies of each book are obtainable from bookshops and most hobby shops, or direct from the publishers, Ian Allan Ltd., Mail Order Department, 33, Knollys Road, Streatham, London S.W.16, price 2/2½ each including postage.

### "THE CHESTER AND HOLYHEAD RAILWAY"

By J. M. DUNN (Oakwood Press. 5/6)

This book has been produced as a centenary study of the Chester and Holyhead railway and its branches, and of the engines and principal trains associated with this North Wales route. The author is a railwayman who has put a great deal of research into the building of his story. As a result he presents an excellent account of the development of this part of the "Irish Mail" route and its main services, with details of its many notable engineering features, including Robert Stephenson's masterpiece, the Britannia Tubular Bridge linking Anglesey with the mainland.

The illustrations are good and well reproduced, and a sketch map and gradient profile aid the reader's appreciation of the line as a whole. The book gives the enthusiast just those engineering, historical and general details that he likes to have about a particular route in which he may be interested.

### "PADDLES"

By EDWARD B. TRACY (Harrap. 4/- net)

Paddles was a sea lion, born off the Californian Coast, where he learned to swim and to fend for himself. One day he was roped and taken ashore for despatch to Ole Swenson, a sea lion trainer, and then he became the most famous sea lion in the world, the only one who could count. His tricks were endless, the delight of all visitors to the circus in which he performed. He travelled all over the United States and eventually he went to Europe, the beginning of a journey round the world. Throughout he had great fun, and many exciting adventures, particularly when the boat on which he was approaching California from Honolulu became a roaring mass of flames. This gave him his freedom, for he was able to swim away to the islands where he was born, to spend the rest of his life in the big sea lion herds found there.

This delightful story is illustrated by excellent line drawings that convey well the spirit in which it is written.

# Turbine-Electric Locomotives in U.S.A.

## New Chesapeake and Ohio Giants

By Francis J. Knight

A STEAM locomotive of unusual design is arousing great interest in American railway circles just now. It has no name, simply a number, and is Chesapeake and Ohio Railway *"No. 500"*; a coal-burning, steam turbine-electric locomotive, claimed to be the largest passenger locomotive in the world. At the time of writing this new locomotive is being exhibited at principal *"C. and O."* stations. Together with two similar ones, also from the Baldwin Locomotive Works, *"No. 500"* is to be used to haul new high-speed luxury trains, *"The Chessies,"* on the Washington to Cincinatti route.

This appearance of this unusual-looking giant, well shown in the illustration, in no way suggests a steam locomotive such as we are used to. The most radical departure from standard design lies in the arrangement of the locomotive. Instead of the boiler being in front of the cab, as usual, and the coal bunker in the tender at the rear, *"No. 500"* has a 29¼-ton coal bunker ahead of the cab. The boiler is at the rear and the water tender is coupled behind the locomotive. Coal is stoked mechanically from the bunker, passing under the cab to the fire-box immediately behind the cab.

*"No. 500"* uses a conventional fire-tube boiler to supply 85,000 lb. of superheated steam per hour to a 6,000 h.p. turbine. This steam is supplied at 290 lb. per sq. in. pressure and at a temperature of 750 deg. F. The turbine is coupled direct to a pinion which drives two gear wheels, each connected to a generator. These twin generators produce electrical energy to drive eight motors which deliver a total of 4,960 h.p. to the 16 driving wheels. The turbine exhaust is used to produce draught by means of the conventional ejector front-end arrangement.

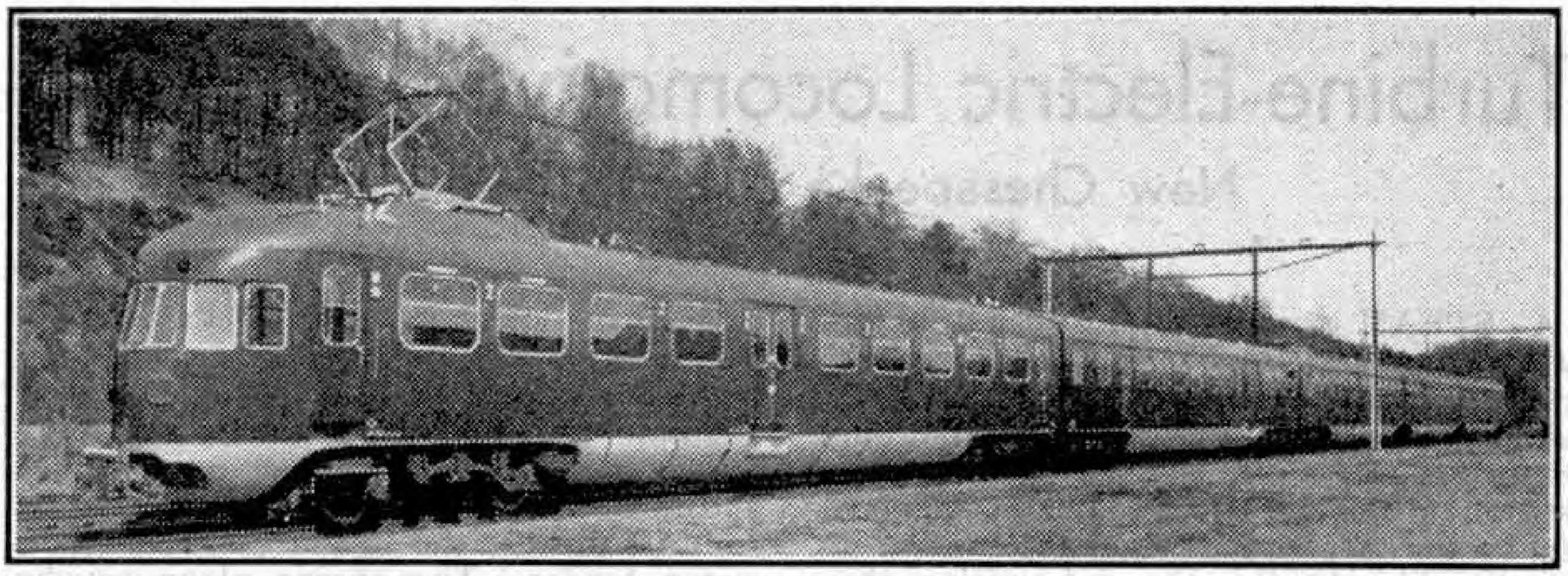
The master-controller that governs the speed of this huge locomotive has 11 different positions, enabling speed to be accurately regulated from slow cruising to the 100 m.p.h. top limit.

The locomotive in orange, aluminium and blue finish, measures just over 140 ft. from its nose to the end of its 25,000 gall. water tender. The engine alone weighs 324.7 tons, and is geared for a top speed of 100 m.p.h. There are 20 pairs of wheels under the engine alone, and eight pairs of driving wheels 40 in. in diameter.

Because this is a coal-burning locomotive, it was necessary to take special measure to provide the electrical equipment with air unpolluted by smoke and steam. For this reason, all air for the blowers in the rear compartment is separated from the generators by bulkhead doors in order to avoid re-circulation of air.

The designer of *"No. 500,"* Mr. K. A. Brown, C. and O. research specialist, aimed at producing an engine to burn powdered coal in place of diesel fuel. His reason for veering away from the popular diesel designs is that, as he puts it, "America has 2,000 years' supply of coal against 25 to 50 years' supply of oil within her boundaries—isn't it just common sense?"

**Chesapeake and Ohio Railway "No. 500," a monster coal-fired turbine-electric locomotive. Photograph reproduced by courtesy of the Chesapeake and Ohio Railway, U.S.A.**



**A typical modern electric train of the Netherlands Railways operating on the overhead wire system. The illustrations to this article are reproduced by courtesy of the Netherlands Railways.**

# Notes on the Netherlands Railways

By S. Wolstenholme, A.M.C.T., A.R.I.C.

A HOLIDAY in Holland gave me the opportunity to observe many interesting features of the Netherlands State Railways. After disembarking from the L.N.E.R. steamer *"Prague"* at Hook of Holland there was of course the Customs examination, but within 20 minutes we were on board the electric train bound for Rotterdam. This service is operated by modern type streamlined coaches equipped with overhead collectors. There does not appear to be any third rail system in Holland. These trains are well furnished and have upholstered seats in the third class compartments, whereas the ordinary coaches are usually plain wood. As I left the train at Rotterdam I noticed that the brakes are applied, not to the rim of the tyre as in normal practice, but to the disc of the wheel itself.

After spending part of the day in Rotterdam we crossed to the Maas station, which has been rebuilt, chiefly with wood and fibre board, as it was destroyed in the air raids. Our train to Eindhoven was also electric, similar to the one described. One is very impressed by the smooth running of these trains. It was on this journey, between Gouda and Utrecht, that I experienced the fastest speed on a train since before the war. The journey from Rotterdam to s'Hertogenbosch was accomplished in one hour and fifty minutes. Since this distance is about 70 miles the average speed was not very high. It must be remembered however that parts of the track appeared to be under repair, and also we passed over two very large new bridges which have replaced those blown up by the Germans and these were still only carrying a single track.

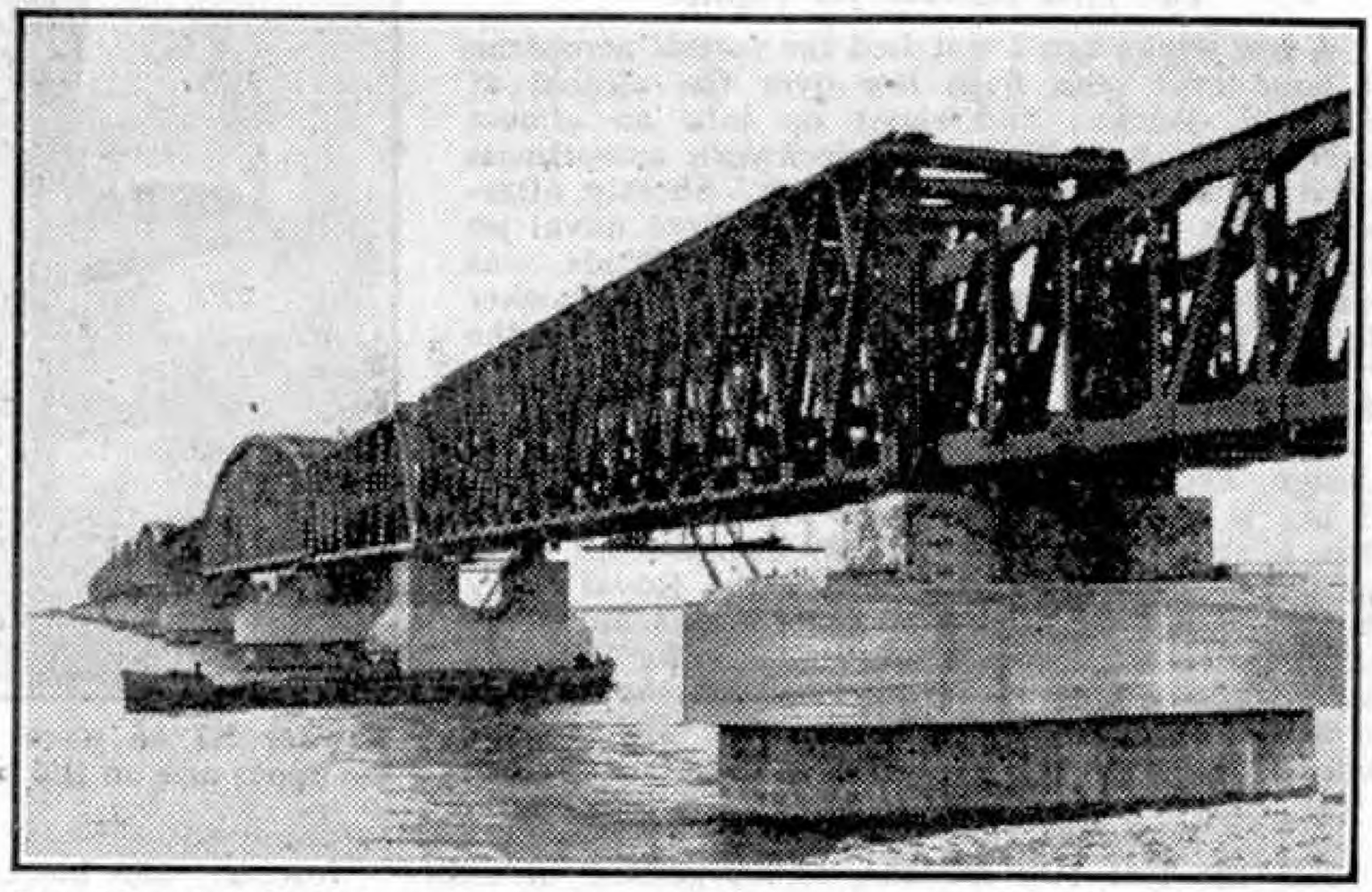
The Dutch have had an enormous task in repairing or rebuilding damaged bridges, for after the war very few were left intact, and one must give them credit for the speed and efficiency with which they have done the job. When I visited Holland in February 1947 the kilometre-long bridge over the Maas near Dordrecht had already been completely repaired and partially rebuilt. During this visit also I travelled from Eindhoven to Luxembourg via Liege and of the hundreds of bridges large and small on this route, not one had been spared in the war and all had been temporarily repaired. Most of these were on the Belgian and Luxembourg railways however, and at that time there was little evidence of permanent structures. Most were simply two girders thrown across the gap and I must confess that I felt anything but comfortable as we passed at less than walking speed over the creaking structures.

However, during my more recent visit I was living in a small town in a house quite near the railway which joins s'Hertogenbosch with Nijmegen. This line is not yet electrified and I noticed that most of the engines were British War Dept. types. Apparently there is still a shortage of locomotives and rolling stock and this is not surprising, as I noticed many sidings filled with damaged vehicles waiting for repair.

I made one short journey in a coach which I was told had originally been German. The whole coach was without any divisions, and wooden seats of a very austerity type appeared to have been hastily installed. The engine was a 2–10–0 War Dept. type made by the North British Locomotive Co. Ltd. of Glasgow. I was invited on the foot-plate by the driver who told me—through my Dutch friend—that this engine behaved very well and in general he liked it very much. He said he was not permitted to exceed 45 m.p.h. as above this speed there was too much rolling.

The rails in Holland are of the flat-bottom type used in most of Europe. Many different ways of laying these were noticed. The oldest method appeared to be to fasten the rail on to the sleeper with three spikes. This method is now reserved for sidings and slow lines. Frequently flat cast iron plates are fitted between the rail and the sleeper, the spikes passing through holes in the plates in the appropriate positions.

Many of the main lines are laid on a similar principle, but three screws are used in place of the spike. Usually the flat bottom of the rail fitted into a slot cut out of the sleeper about $\frac{1}{4}$ inch deep. This takes the strain of side slipping off the screws, and also allows the screws to fit flush with the rail, as when spikes are used, but here again the plate if used was of such a shape that the screws could overlap the rail bottom and still screw right down on to the plate.



**The Moerdyk Bridge, one of many Dutch railway bridges that have been repaired after war-time damage.**

The modern way of fastening the rails uses a type of cast iron chair which is fixed to the sleeper with four screws. The rail drops into a shallow recess in this chair and is held firmly in position by two inverted bolts, the heads of which fit into a slot, and the rail is held by a square washer overlapping the rail bottom and fastened with a nut. To remove a rail it is therefore only necessary to give the nut a few turns and then tap out the bolt from the slot sideways. The rail is then free. This seems an excellent method.

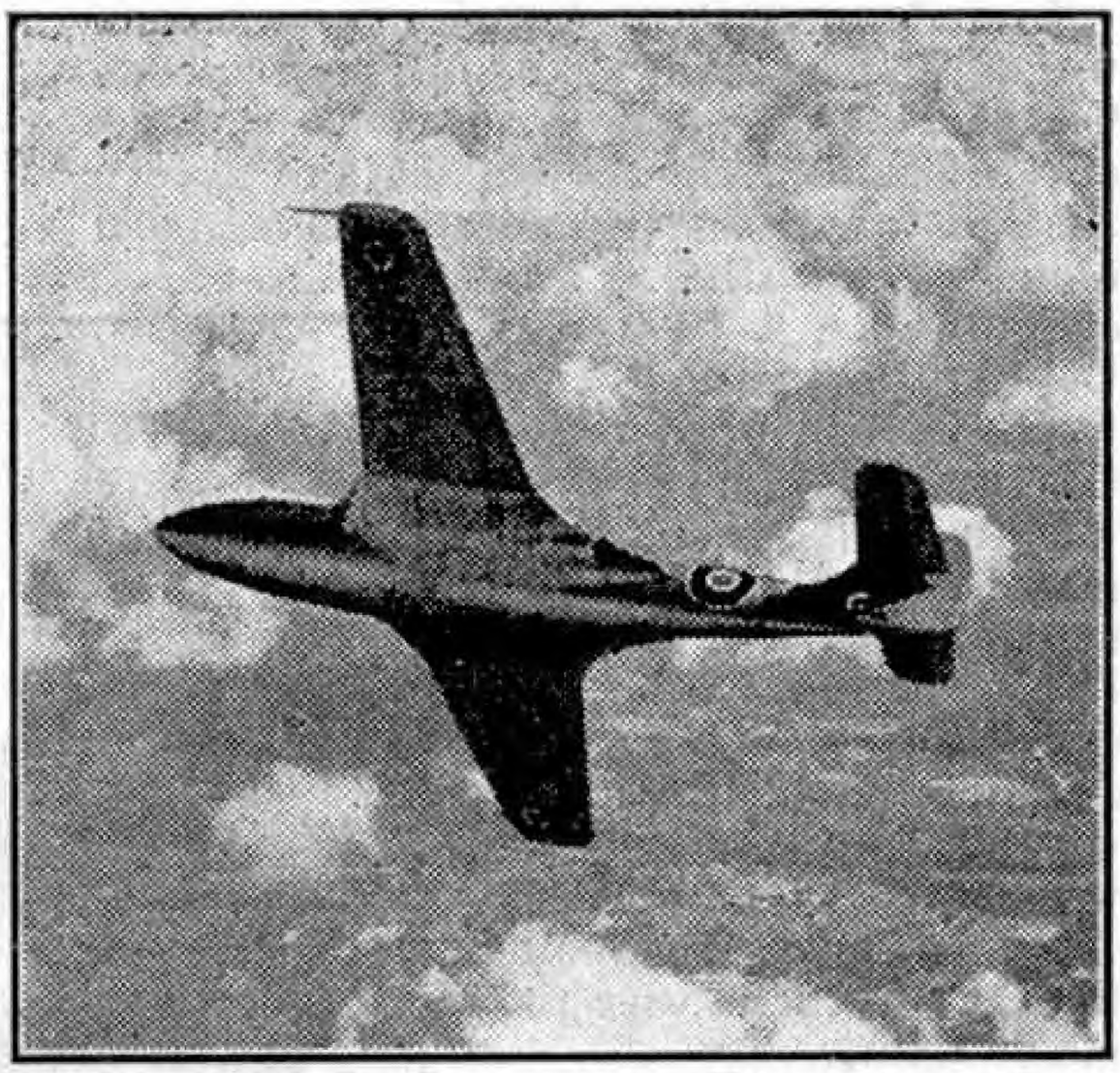
The Dutch seem to have experimented with many kinds of fish-plates, of various lengths, shapes and hole positions. The type that appears to have become standard is much longer than our four-hole plate. It also contains four holes, rather widely spaced, and by virtue of its shape rests on the two chairs supporting the ends of the rails, and in effect makes a bridge across the gap between the two end sleepers. I noticed that this type of joint did not appear to bend when a wheel passed over as is frequently seen on our tracks. Also the tracks I examined showed no permanent sag at the joints such as appears rather common on some of our lines, especially where we use

(*Continued on page 409*)

**Exterior view of Amstel Station in Amsterdam.**

# Air News

By John W. R. Taylor



**Hawker N7/46 naval jet fighter. This photograph and the upper one on the next page are by courtesy of Hawker Aircraft Ltd.**

### The First Hawker Jet Fighter

A few weeks ago I watched the fastest aeroplane I have ever seen flash low over the airfield at Langley, Bucks., and shoot up into an almost vertical climb, rolling with clockwork smoothness as it dwindled rapidly to a speck. Shortly afterwards the aircraft, Hawker's new N7/46 naval jet fighter, landed, and its pilot, Trevor Wade, was asked why it is so good. "Because it is a Hawker fighter," he replied, and, remembering the "Hurricane," "Typhoon," "Tempest" and "Fury," few people would have argued with him.

Little may be said about Sydney Camm's latest design, except that it has a wing span of 36 ft. 6 in., is powered by a Rolls-Royce "Nene" and has a speed of well over 600 m.p.h. But it is quite obvious that in the N7/46 the Royal Navy has an aeroplane almost without match anywhere in the world. "Almost," but not quite, for Hawkers have already announced a successor—the E38/46—which is basically the same thing with swept-back wings and an even higher speed.

### "Operation Moo-Cow"

For the last two months, 43,000 gallons of milk in churns have been flown each day from Belfast to Blackpool and Liverpool in a fleet of two "Liberators," six "Halifaxes" and six "Dakotas," owned by British charter companies. Each of the "Dakotas" carried 55 ten-gallon churns and the "Halifaxes" 65 to 70 churns.

The entire operation was planned to the last detail long before it started, so that a 24 hr. schedule could be maintained, with each aircraft performing several trips daily. Special hangars and discharging and maintenance facilities were installed at the discharging ports, and a 50 per cent. reserve of serviceable aircraft was maintained by the operators in case of emergency.

### U.S. Troop Carriers

The U.S.A.F.'s standard troop-carrying aircraft, the Fairchild C-82 "Packet," is being supplemented in service by an improved version, designated C-119, which uses two 3,250 h.p. Pratt and Whitney engines and so has nearly twice the power of the C-82.

The C-119 is designed to carry a nine-ton payload for a range of 2,000 miles, and its boxcar-like fuselage has ample space for a ten-ton payload over shorter distances. It can accommodate 42 paratroops, with 20 paracans of supplies suspended from an automatic overhead monorail. As an ambulance 'plane it can transport 36 litter patients and attendants. The fuselage nose has been redesigned to give the pilot a better field of vision, particularly downward, and the loaded weight has increased to around 74,000 lb.

### New De Havilland Factory

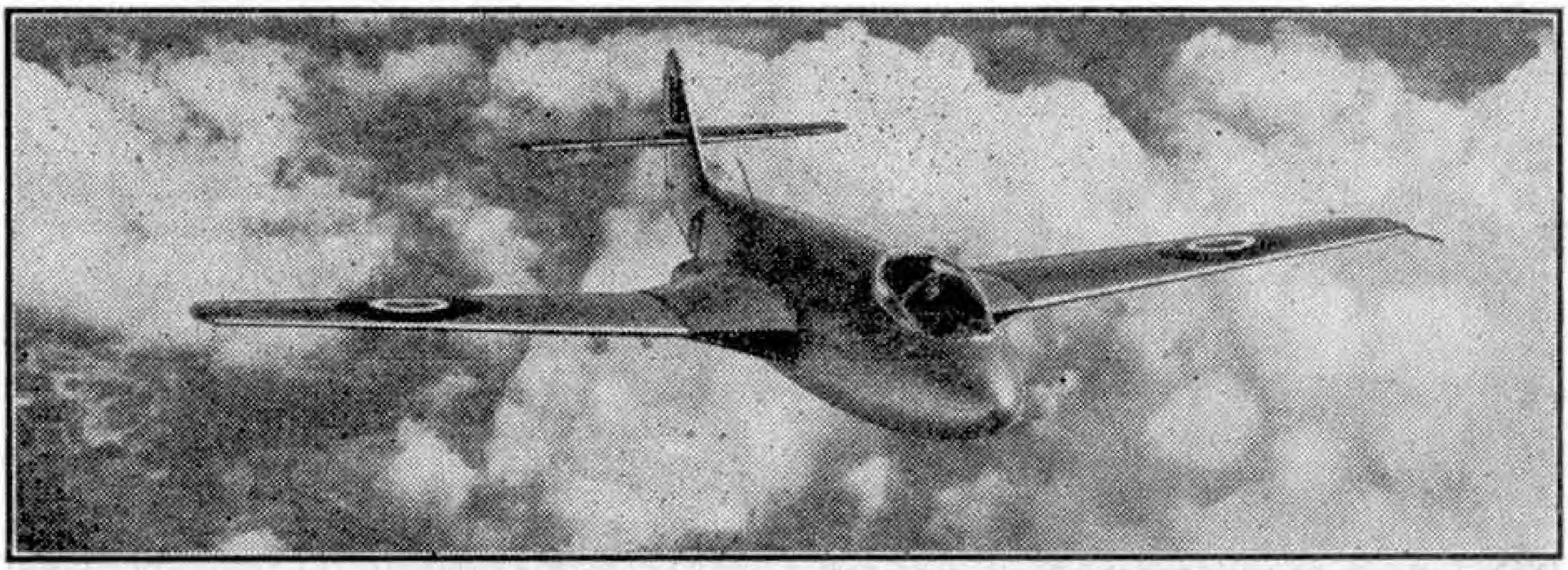
To make possible prompt fulfilment of their £10,000,000 worth of export orders, the de Havilland Company have taken over the large Government factory at Broughton in Cheshire, which was engaged on aircraft work under the management of Vickers-Armstrongs Ltd. during the war and has since been used for the production of aluminium prefabricated houses. It has an area of about one million square feet and is approximately the same size as de Havilland's parent factory at Hatfield.

### Britain's Fastest Air Liner

The lower illustration on this page shows the Handley Page "Hermes" IV, Britain's fastest air liner and the largest landplane so far flown in this country. This fine 40-seater machine has a top speed of 357 m.p.h., cruises at 300 m.p.,h., and has a range of more than 3,600 miles.

Delivery of 25 luxuriously-equipped, fully pressurised "Hermes" aircraft to British Overseas Airways Corporation is expected to begin early next year, and eventually the Corporation will have 40 of these machines in service.


**Handley Page "Hermes" IV, Britain's fastest air liner. Photograph by courtesy of Handley Page Ltd.**



**Another view of the Hawker jet fighter in flight.**

### Light 'Plane, Heavy Going

A report from New Guinea tells of excellent service being given by a British-built Auster "Autocrat" light 'plane, operating in conditions described as "probably the most arduous in the world." It is being used for general charter and freight work in the mountainous country there, and is often flown from aerodromes at least 3,500 ft. above sea level with loads of more than 600 lb. The "Autocrat's" owner says he has complete faith in it and could not suggest any other light 'plane that could do the job so well.

New Guinea is an ideal testing ground, as high temperatures and humidity, rugged terrain and awkward airstrips, combine to make flying a hazardous operation even when conditions are at their best.

The "Autocrat" was shipped to Australia, where it was assembled and then flown over 2,000 miles to Wau, New Guinea, in 2½ days' easy flying at an average speed of over 100 m.p.h.

### U.S. Flying Boat Fighter

Following the success of the revolutionary British Saunders Roe SR/A1 jet-fighter flying boat, reported in the Dec. 1947 "*M.M.*," comes news that the Consolidated Vultee Company, U.S.A., are developing an aircraft of this type. It will be called the Convair "Skate," will be larger than the single-seat SR/A1 and will have a crew of two or three. It will incorporate several novel features, including retractable chines to reduce air drag. Armament will consist of 20 mm. cannons and a belt-fed, internally-mounted rocket launcher, and it will carry 1,000 lb. bombs. The prototype should be flying next Spring, if powerful enough jet engines are available by then.

### Miniature Helicopters

A miniature electrically-driven helicopter, known as the "Skyhook," has been developed by two American engineers, John Duncan and Hewitt Bayley. It is designed to carry loads up to 10 lb. at heights ranging from 500 to 1,000 ft., weighs 15 lb. and uses 7 ft. diameter rotors. It is easily transportable, a complete kit containing the helicopter, cable, winch, spare parts and carrying case weighing only 50 lb.

In winds of 30 m.p.h. or less the "Skyhook" can take the place of a 500 ft. mast and be used for low-level meteorological soundings, radar target work or as a portable transmission aerial. It can be employed as a sounding platform for radar and for photographic survey work.

### A New Ultra-Light Aeroplane

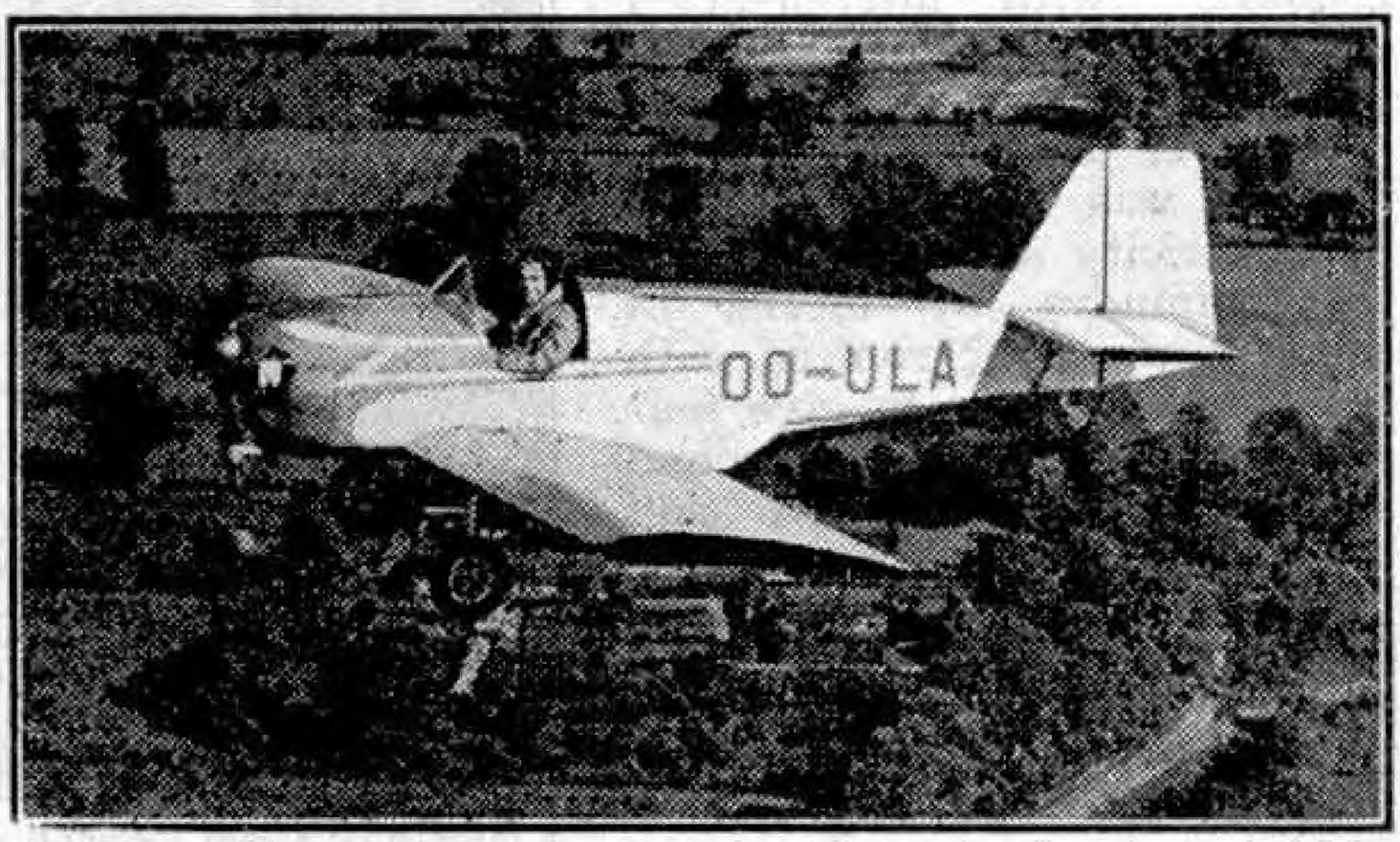
The little Fairey "Junior," illustrated at the foot of this page, represents one of the first practical attempts to provide a single-seat ultra-light aeroplane with a worthwhile performance. The more usual powered gliders are little use in anything but calm conditions, and most light 'planes are too expensive for the average man or woman. The "Junior" appears to be the perfect compromise, for it is a "half-scale aeroplane with full-scale performance." With a span of 22 ft. 8 in., it weighs only 430 lb. empty, less than many motor-cycles.

Very spritely, it has a speed of 78 m.p.h., using a J.A.P. engine of only 36 b.p., and is fully aerobatic. An idea of its operating economy can be gained from the fact that a Fairey test pilot flew the prototype 86 miles, from Ostend to Folkestone, using only 1½ gall. of fuel on the trip. Construction is simple but sturdy.

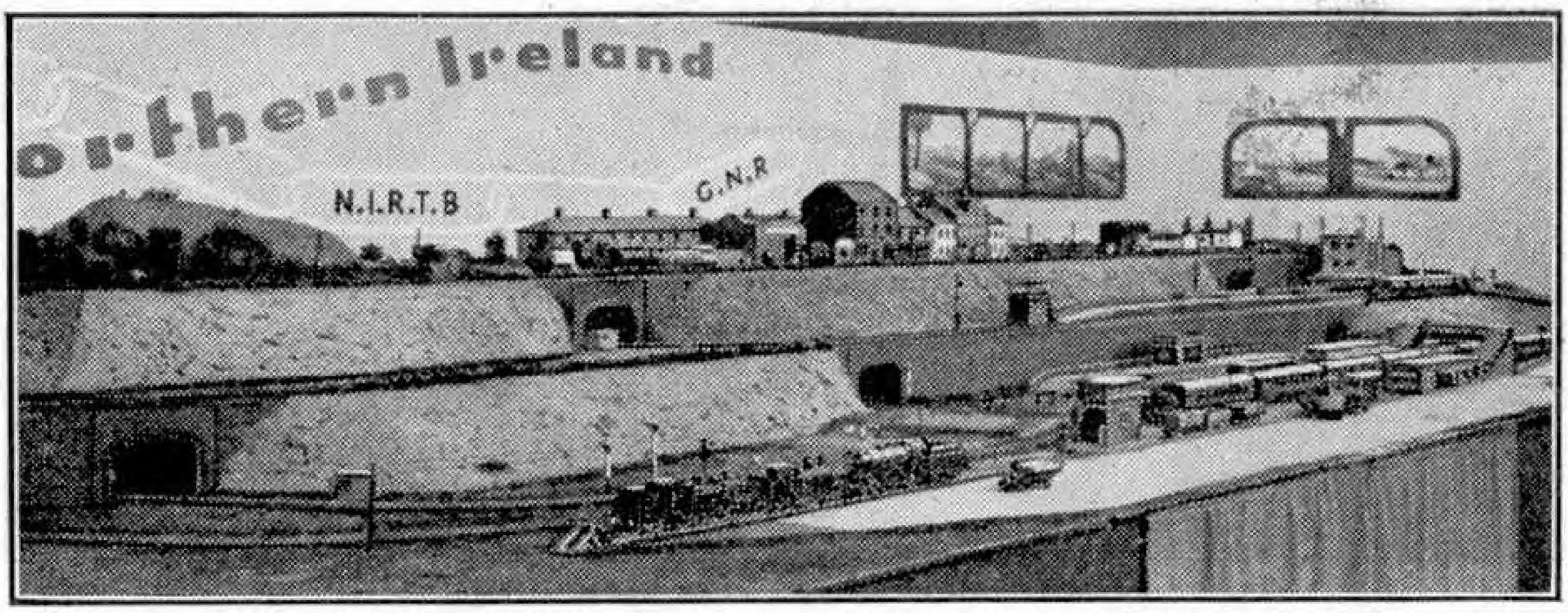
To qualify for his "A" licence the pupil must in future put in about 30 hrs. solo flying. He could do this in a "Junior" with maximum enjoyment and minimum cost. If a supply of suitable engines could be obtained, Fairey's probably would be able to build the "Junior" for as little as £500.

### More "Shooting Stars" for U.S.A.F.

President Truman has approved the purchase of 100 more Lockheed F-80C "Shooting Star" jet fighters for the United States Air Force, bringing the total now on order for that Service up to nearly 600. The F-80C is the latest model of this fighter aircraft and has a top speed of about 600 m.p.h.




**The Fairey "Junior" single-seat lightweight aircraft flying over typical English countryside.**




**Part of the exhibit representing the road and rail transport systems in Northern Ireland at the Royal Ulster Show, Belfast. This photograph and the description below are by courtesy of the G.N.R.(I.).**

# A Northern Ireland Transport Display

THE illustrations on this page show parts of the remarkable transport display staged jointly by the railway and road transport authorities of Northern Ireland at the Royal Ulster Agricultural Society's Show, Balmoral, Belfast, last May. On a built-up stand there was a complete two-level gauge 0 railway, and above that was arranged a typical stretch of Ulster countryside with village and farmstead served by road transport vehicles.

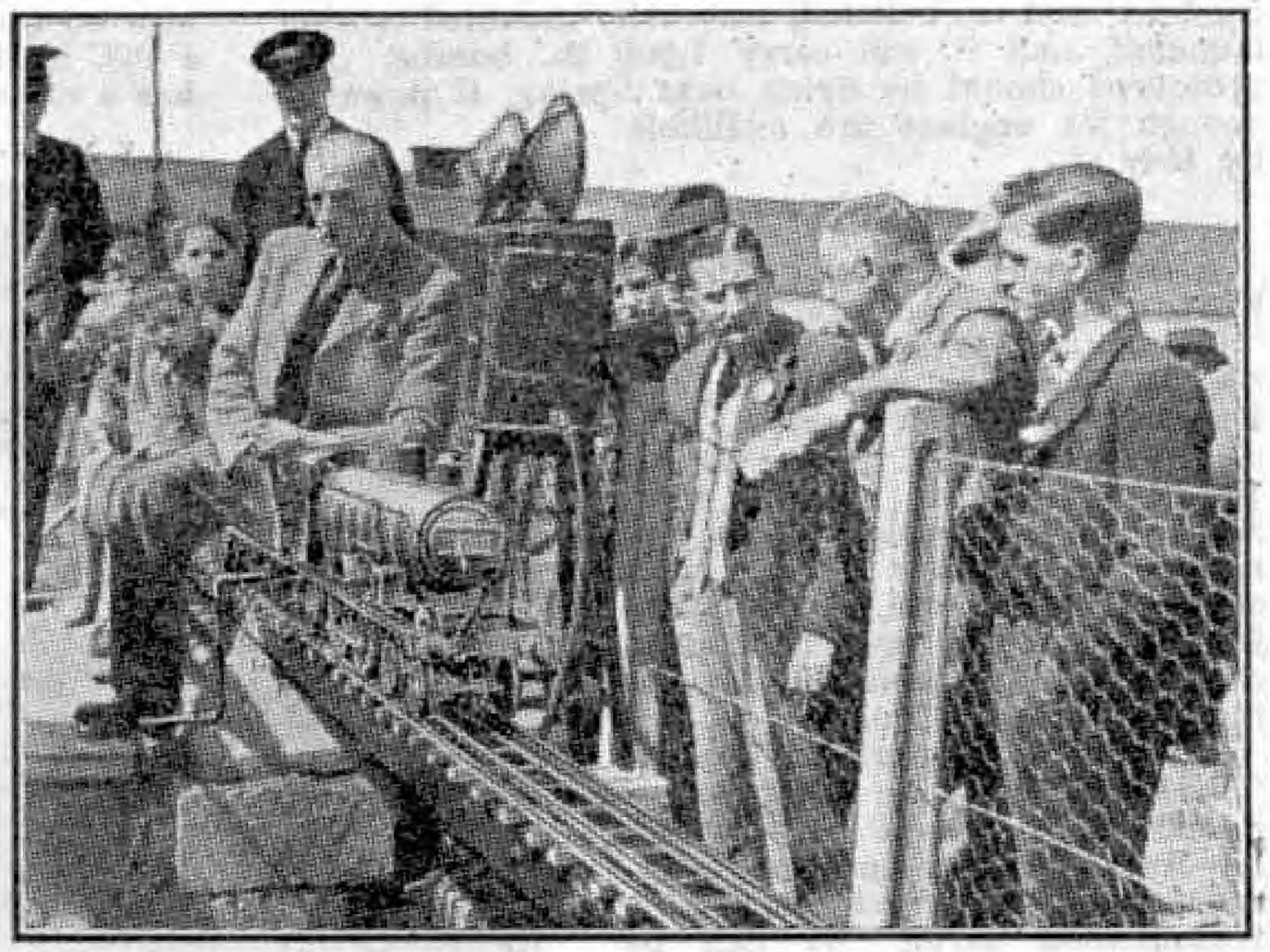
The trains included a miniature G.N.R.(I.) "Dublin-Belfast" express of seven coaches with dining and kitchen cars hauled by the 4-4-0 express locomotive *"Eagle."* A four-coach train in charge of a typical 4-4-2T represented the Belfast and County Down Railway. The British Railways (N.C.C.) "*North Atlantic Express,*" with interior-fitted coaches, was hauled by a 2-6-4T of the latest type.

A novel feature of the locomotives was smoke, generated by electricity and ejected from the chimneys by means of small pumps synchronized with the driving wheels to give four puffs per revolution. A sound apparatus allowed each puff to be heard. The device, which has taken many years to perfect, is the invention of Mr. Cyril L. Fry, of Dublin, who built all the railway rolling stock and designed the control gear.

All the models were in operation at the same time. After being switched on they were left to themselves, the trains stopping and starting independently at stations. The home signals were arranged to go "off" before the distant signals by means of a master switch, which also locked the points.

On the road, complete with traffic signals, models of the latest Northern Ireland road transport vehicles were operated by means of a motor-driven endless chain beneath the roadway.

A passenger-carrying track was in operation with 5 in. gauge "live steam" locomotives, and another special attraction was a miniature motor bus in which four young passengers at a time could ride.

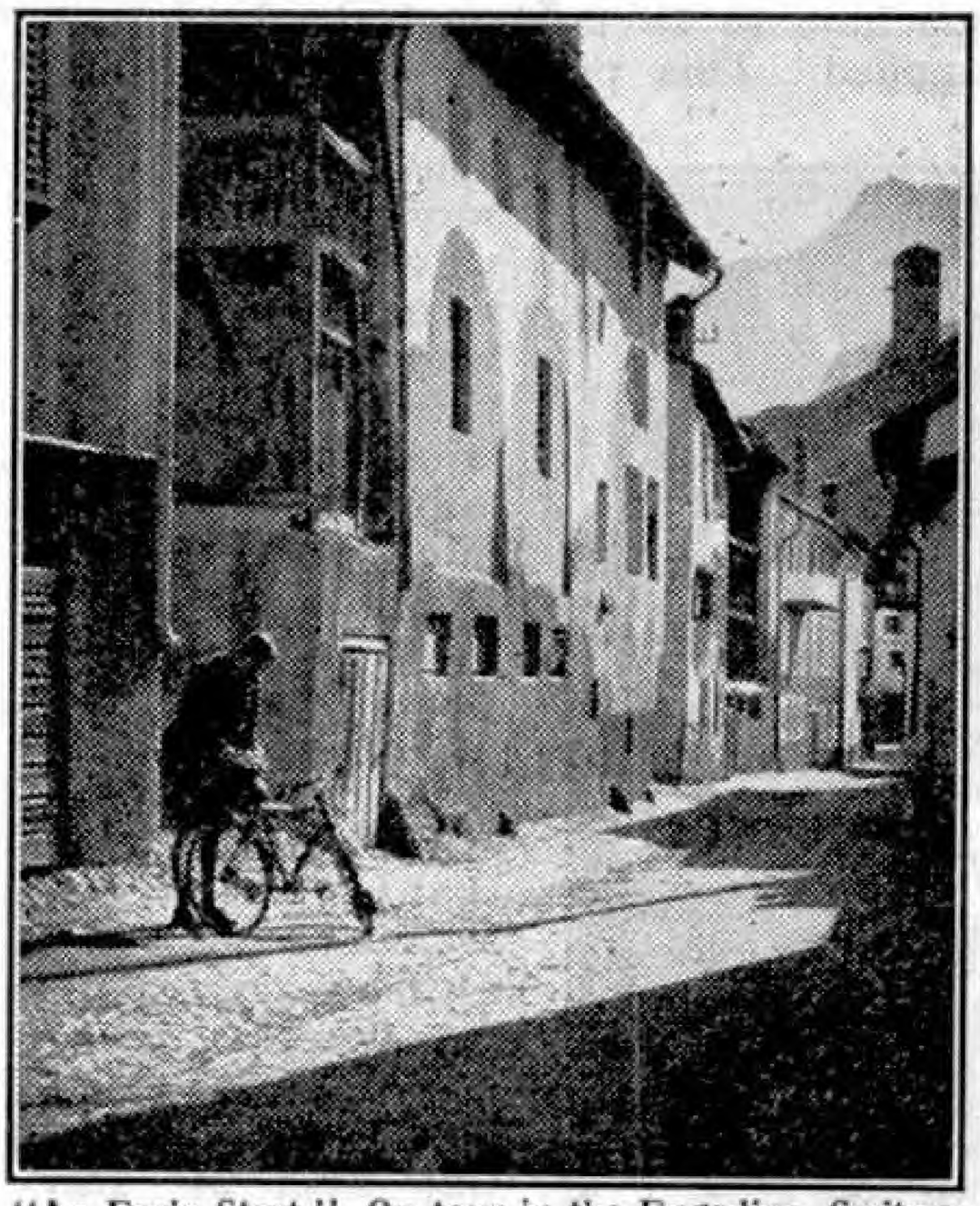


**A large-scale steam locomotive that dealt with numerous train loads of passengers at the Royal Ulster Show. Photograph by courtesy of the "Belfast Telegraph."**

# Photography

## Making Gaslight Prints

MAKING gaslight prints is great fun, and the only equipment needed is a printing frame, gaslight paper, a couple of dishes—one for developing and the other for fixing—a good-sized bowl of water and the necessary chemicals. A ready-made developer such as Johnson's



"An Early Start." On tour in the Engadine, Switzerland. Photograph by R. H. Bushell, Hoddesdon.

"Universal" is the simplest, and the same firm's acid hypo fixing is excellent.

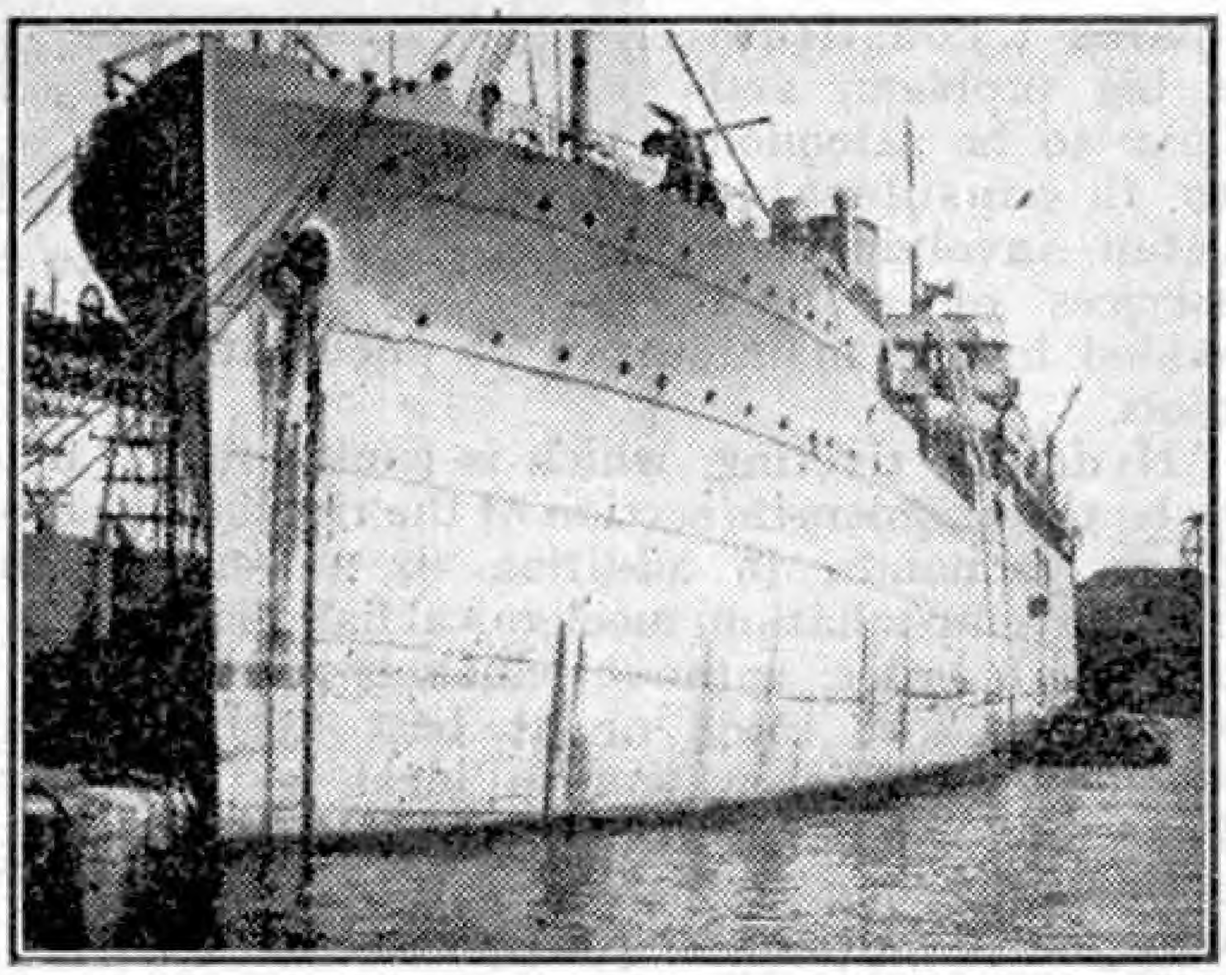
Your negatives will vary in density, and therefore will need different exposures. Sort them into three groups—thick, medium and dense—and make a series of trial exposures with one of the medium negatives, using each time only a strip of gaslight paper. The strips when developed will show which exposure gives the best result, and from this satisfactory exposures for the other groups can be gauged. All operations other than making the actual exposure should be done in shadow, which can be provided by one's own body.

An ordinary 40 watt lamp or incandescent gas light is suitable for printing, and the printing frame

"Rags," a South American Parrot. Photograph by J. H. Taylor, Aberdeen.

should be held about 12 or 18 inches away. Development should be complete in about 35 to 40 seconds. If the image flashes up and then blackens, exposure has been too long; if it takes more than a minute to complete, the print is under-exposed.

Rinse the developed print in the bowl of water and then submerge it face downward in the fixing bath. Move it about for a few seconds and leave it there for 10 to 15 minutes. Afterwards give it a series of 5-minute soaks in clean water, to get rid of chemicals. Finally pin up the print to the edge of a shelf to dry.



A liner in the refit basin. Photograph by J. R. Edwards, Birmingham 28.

# Hydraulic Riveting in the Shipyard

By John H. Kerr

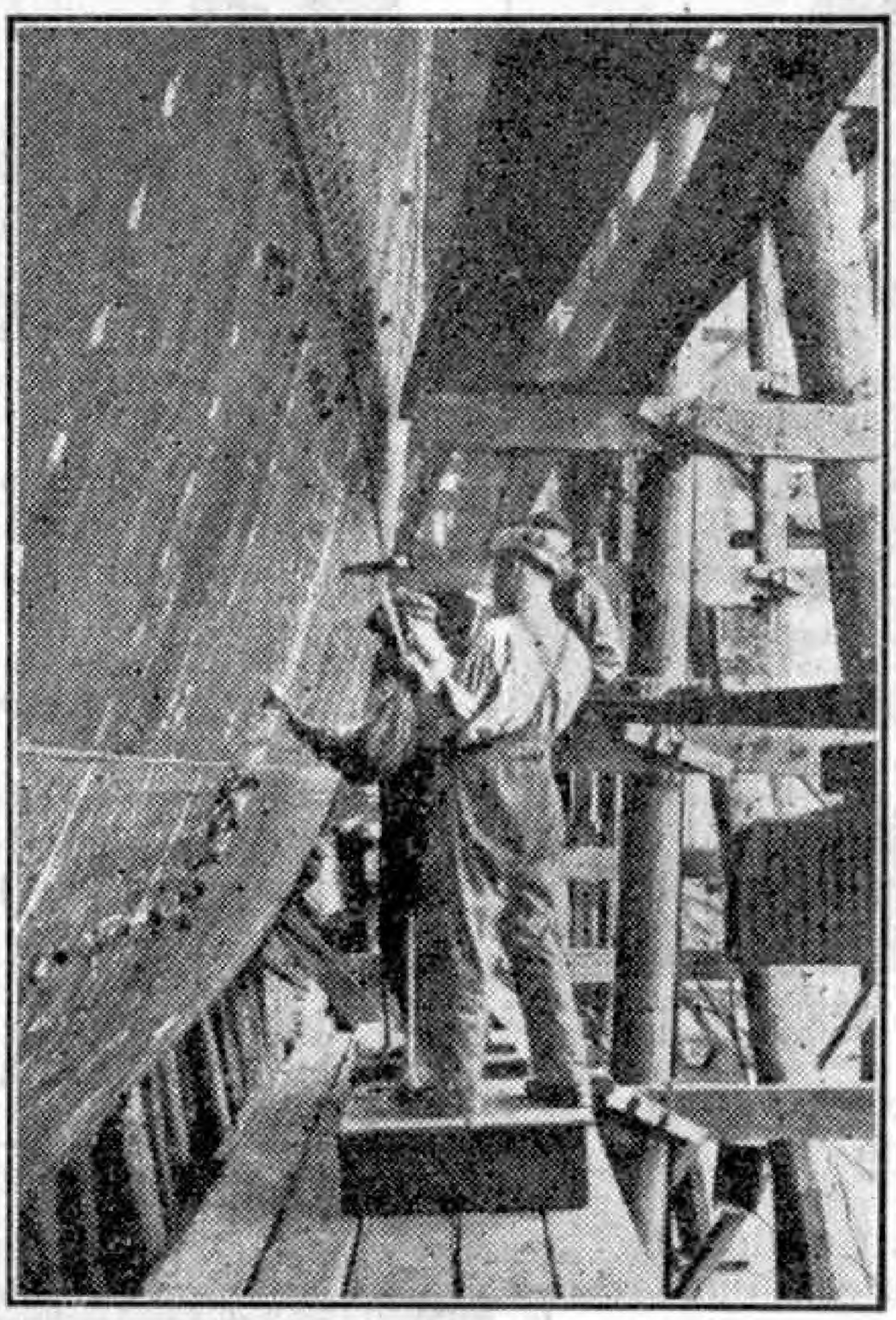
RIVETING in the shipyard is divided into three sections, hand, pneumatic and hydraulic. In the last-named method the appliances used are large and heavy, requiring some form of mechanical handling for their operation. Hand riveting is the oldest and least expensive of the three to equip, provided that skilled workmen are available. The gear required by a hand squad is almost negligible by comparison with that needed for other methods. Unfortunately, this class of riveting seems to be dying out, as a youthful squad is rarely seen.

Pneumatic riveting, which is now very popular in all branches of shipbuilding and engineering, requires special consideration. Means of obtaining an air pressure suitable for the various types of machines must be installed; this may be either permanent or portable, and is determined by the nature of the work to be done. The riveting machines, accessories and spares constitute a big problem, and have to be attended to in considerable detail, involving the services of a man skilled in the maintenance of pneumatic tools.

Hydraulic riveting, which is considered to be the aristocratic section of the riveting trade, demands, in addition to a very expensive installation, mechanical handling of a high order, without which it would become a lost trade or at best attain mediocrity. The system is ideal, it is fast, and when operated by a skilled craftsman using proper dies it is with very few exceptions well-nigh perfect.

The installation is very expensive and requires very careful consideration. Special attention must be given to the layout, so that the fullest possible use may be obtained not only for the riveting section, but for any hydraulic machinery that may be considered essential to production.

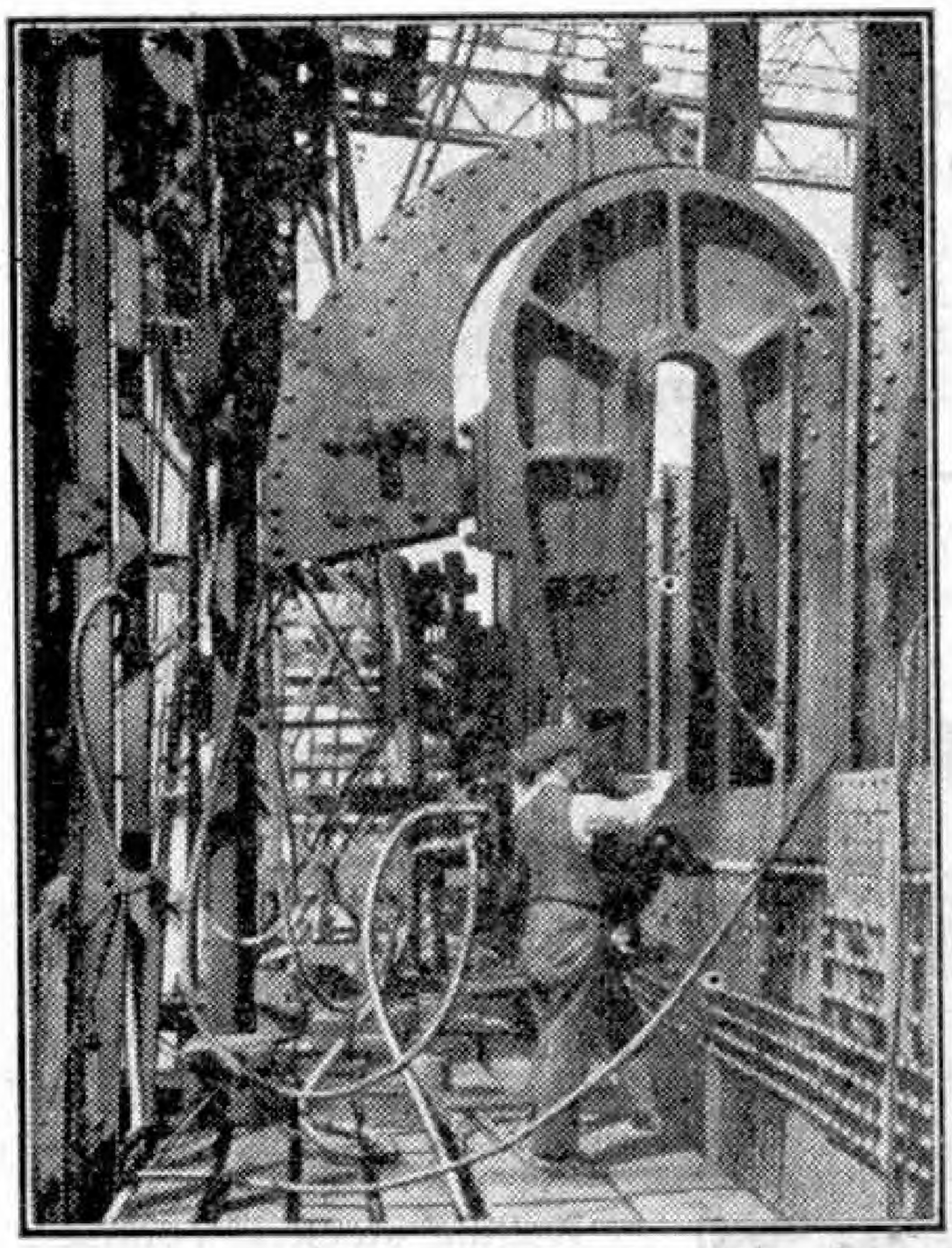
Unlike hand and pneumatic riveting, in the hydraulic system the rivet is squeezed, the pressure employed ranging from 800 lb. per sq. in., depending on the machine to be used and the load to be applied. This pressure is developed by pumping machinery, delivering water by way of a non-return valve to a vertical ram carrying a weighted structure; this combination is called an accumulator, and it determines the pressure which will remain constantly on tap in the hydraulic pipes while the accumulator is floating. The riveting machines that use this pressure are many and varied, and are generally described as having "Gap" and "Daylight." Thus a 6 ft. Gap with 24″ Daylight means that there is a distance of 6 ft. from the centres of the dies to the inside wall of the machine, and one of 24″ between pincers, not including dies.



**Hand riveting in progress on the shell of a ship.**

A glance at the illustrations on the next page will convince the reader that these hydraulic machines cannot be utilised without mechanical handling, as their weight is considerable, and their working positions may be horizontal or vertical; or indeed at any angle to suit the job on which they are engaged. They may be suspended from a tower crane, a steam crane, or a back ballast jib crane with full circle swing, or from any suitable apparatus.

In order to expedite the job, it is imperative that a means of raising or lowering the riveting machine may be in the hands



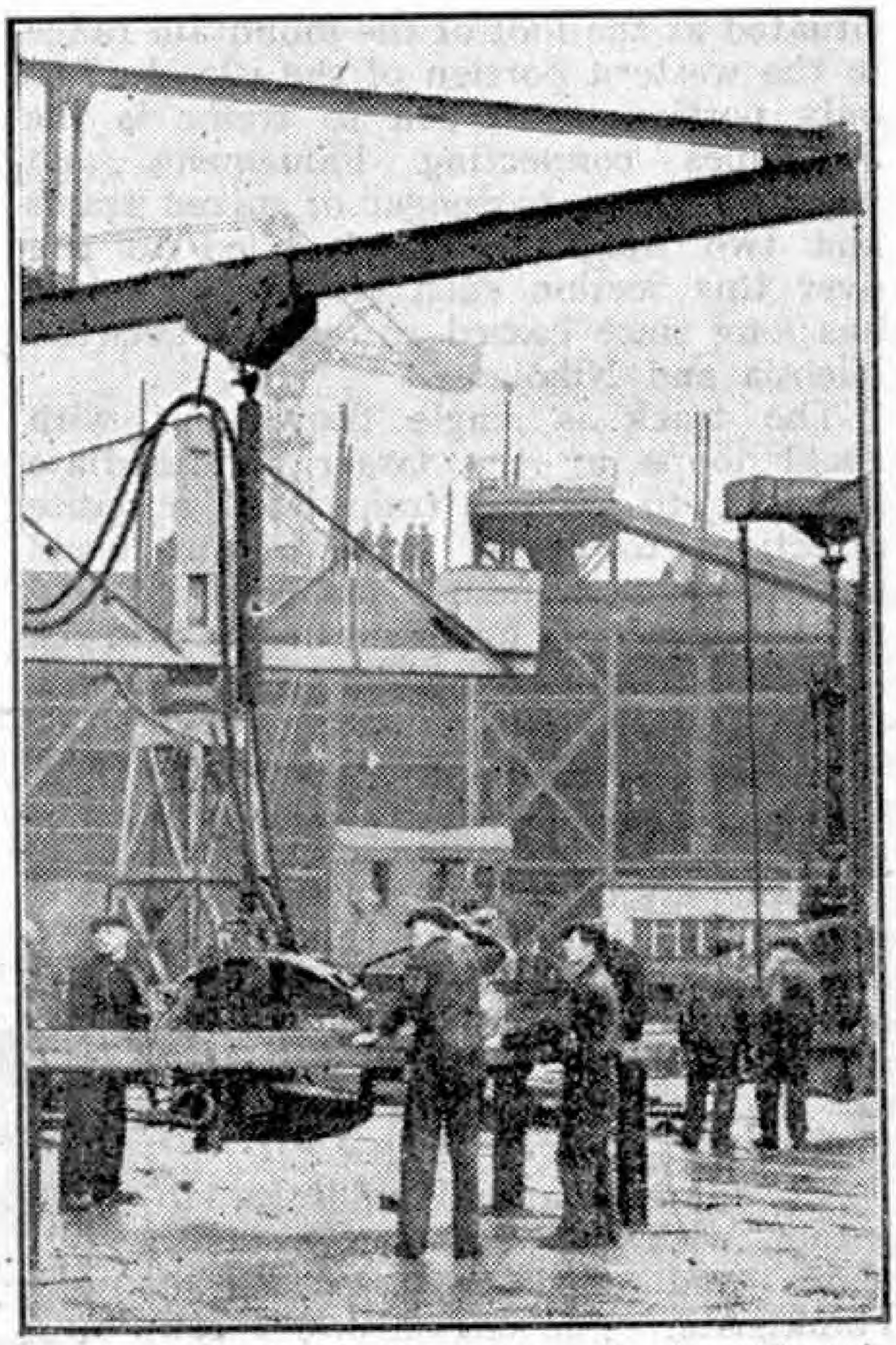
Hydraulic riveting on the sheer strake.

of the riveter. This is cleverly done by utilising the hydraulic power to operate a lift, which is situated between the crane hook and the riveting machine, and is controlled by a valve within easy reach of the riveter.

A hydraulic riveting squad is generally composed of two riveters, a holder-up, a heater boy or hotting lad, and a catch boy or handing lad. In a complete cycle of operations the heater boy pitches or carries the almost white hot rivet to the catch boy, who inserts it in the hole prepared. The holder-up then presents the jaw of the riveting machine under his control to the head of the rivet and literally holds on, while No. 2 riveter, on the opposite side of the prepared job, ensures that the rivet shank is in line with the lower jaw and indicates that everything is ready for the squeeze. No. 1 riveter then operates the lever which applies the load, and when he is satisfied that the rivet is properly finished, the machine is exhausted into the return line to the fresh water tank. The machine moves to the next prepared hole and another cycle is commenced.

In a single 9-hr. working day's hydraulic riveting 11,209 rivets were once driven home, all of them passed by Lloyds and the surveyors. This record-breaking feat was performed by a riveting squad in the shipyard of Workman Clark Ltd., Belfast, in 1918, and was truly a remarkable performance of skill and endurance. The day's work also included the exchanging of the riveting machine on two occasions because of mechanical faults. Fortunately probable mishaps were considered in the preparations, and three spare machines and three spare furnaces were "standing by," a very wise precaution indeed, as subsequent events proved. Many experiments were made to attain the greatest number of squeezes per hour, and rehearsals and discussions ensured the success of the effort.

Rivet heating plays a very important part in fast riveting, and many methods are used to enable the riveter to obtain his rivets when and how he wants them. Rivet heating furnaces may be fired by gas, oil or coal, or the rivets may be heated in an electric furnace. Each method of heating has its supporters. The author favours a gas-fired furnace, and has found that when fitted with a well-designed fireclay moulding, or with a good arrangement of firebricks, and given a periodic examination, with due attention to repairs, this type of furnace is highly satisfactory.

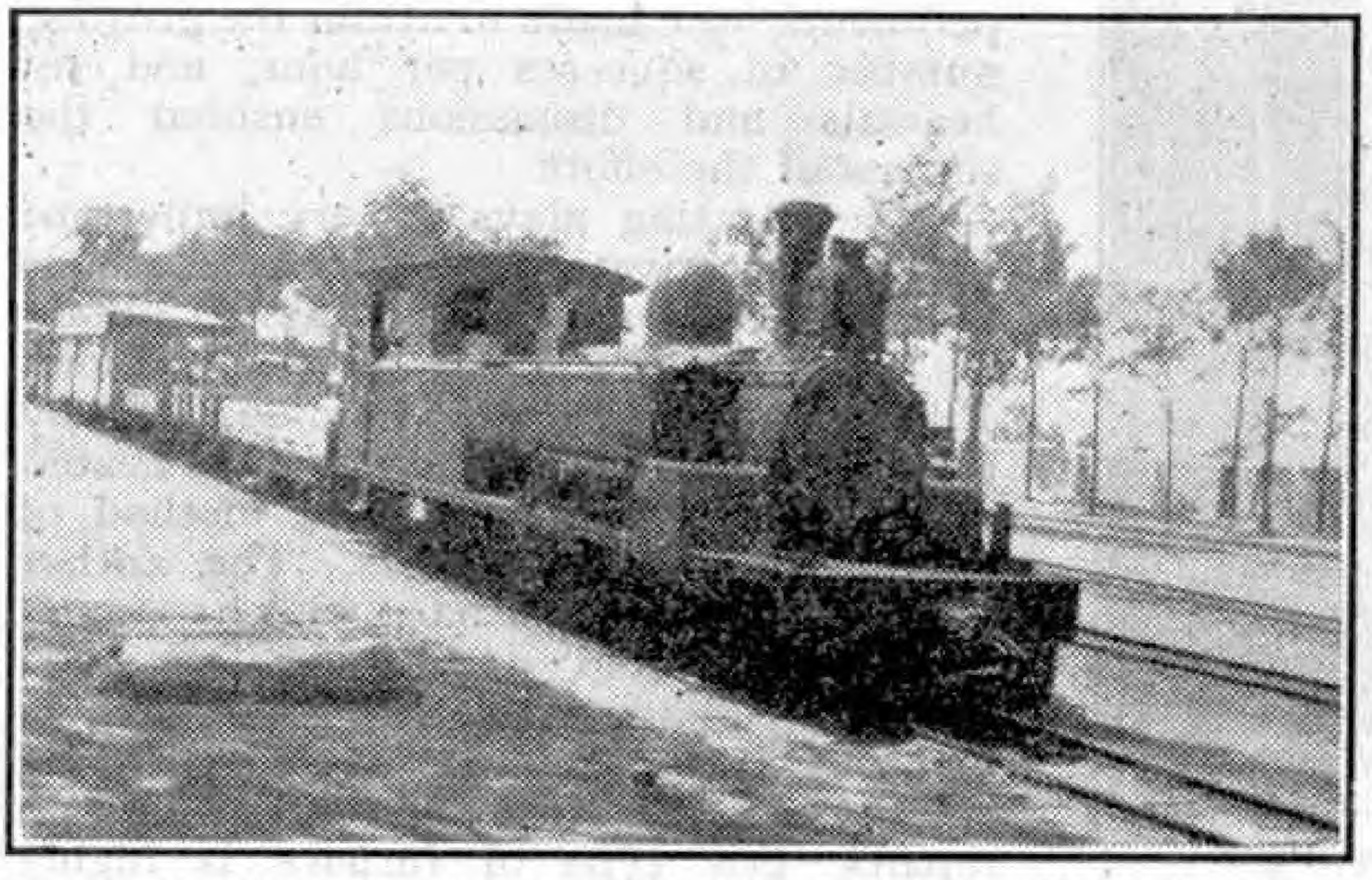


In the hydraulic riveting compound of a shipyard.

# The Cyprus Government Railway

By G. Tanner (late Royal Engineers)

THE Cyprus Government Railway is a narrow-gauge line between Famagusta on the eastern coast, Nicosia the island capital, and Nikolaos, a small village situated at the foot of the mountain range in the western portion of the island. The only portion now open to traffic is the 35 miles connecting Famagusta and Nicosia. Three passenger or mixed trains and two freights are scheduled to run over this section each weekday. Traffic has long since ceased to operate between Nicosia and Nikolaos.



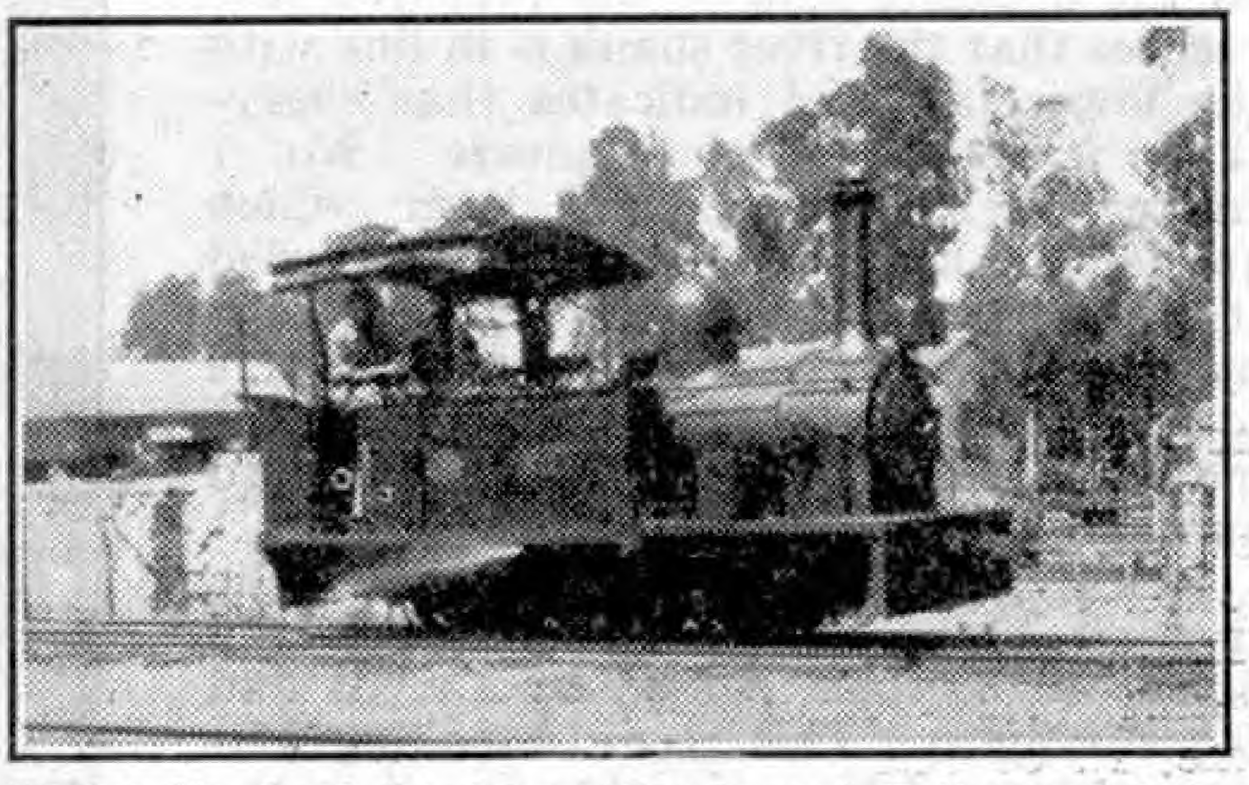
**A train at Nicosia headed by 4-8-4 tank engine No. 41 of the Cyprus Government Railway.**

The track is single throughout with small loops at the larger intermediate stations to allow trains in opposite directions to cross. It is of the usual narrow gauge standard, the flat-bottomed rail being secured by spikes driven into the sleepers. The permanent way is rather neglected, weeds being numerous for many miles. The line follows the general run of the land, and with the exception of a small portion after leaving Famagusta station no cuttings or tunnels are seen. No signals are installed, the system of single-line working by train staff being used. Flagmen are posted at the stations where loops are installed.

All administration buildings, together with the locomotive repair shops and sheds, are located at Famagusta. The engine power consists of several 2-6-0 tender oil burners such as Nos. 21, 22 and so on; No. 11, a 4-4-0 tender oil burner, and No. 1 an 0-6-0 tank built by the Hunslet Engine Company in 1904. In addition there are several Kitson-built 4–8–4 coal-burning tank engines, Nos. 41 and upward. Small petrol-driven rail cars which haul two small trailers seating 12 passengers each are also used for the passenger services. Three such units form one complete train, and as the second and third units closely follow the first they provide the unusual sight of what appear to be three separate trains separated by only a few yards.

Rolling stock is confined to 8-ton high-sided bogie open wagons, 8-ton box cars, some of which are converted second-class coaches, and some "Heath Robinson" kind of tank wagons. The latter are nothing more or less than tanks chained to ordinary flat wagons and are used for the transport of petrol and oil. The third-class coaches weigh 12 tons and were constructed in 1920 by the Leeds Forge Company.

The journey by passenger train from Nicosia to Famagusta is scheduled to occupy 1 hr. 55 min. at the time of writing, so no outstanding running feats are performed. This schedule, however, allows for time waiting at stations for trains in the opposite direction to pass.



**Engine No. 1 of the Cyprus Government Railway used for shunting at Famagusta. It was built in 1904.**

# Club and Branch News

## WITH THE SECRETARY

### EXHIBITION SUGGESTIONS

We are now approaching the season when Clubs arrange Exhibitions and festive gatherings. This year these should be on a greater scale and more successful than they have been for a considerable time, as existing Clubs are growing in strength and new ones have come into existence.

It is a good thing for any Club, whatever its size, to arrange a display of some kind. If members are few in number and do not feel that they have sufficient resources to organize a complete Exhibition to which all and sundry can be bidden, they should organize an Open Night for the benefit of their parents and friends. These will be delighted to have the opportunity of seeing exactly what is done at Club meetings, and two advantages will certainly follow. In the first place some at least of the visitors will seek some way in which to encourage and support those who belong to the Club. In the second place experience will be gained. This means that the next Open Night will be brighter and more successful, and in time the members will come to feel that they can put on a really good show.

Those in charge of larger Clubs who decide to hold an Exhibition to close the present Session must remember that mere size is not sufficient. Visitors may be impressed to discover laid out before them a large mass of models, but they only become really enthusiastic when they are confronted with well-built models arranged on some definite plan. As an example of what should be done the Factions Exhibition of the Maylands M.C. referred to in "*Club Notes*" can be cited. The Factions or sections of this Club are three in number. Members of each decided upon a definite scheme. For instance, one Faction decided to illustrate the manufacture of bricks. With a little ingenuity the necessary setting was built up, including the pit from which the clay is dug and the buildings in which the machinery is housed, and then the necessary models were built and placed in correct position. Visitors could see at a glance what the plan was, and then turned with delight to the examination of the models incorporated.

### TEAM WORK PAYS

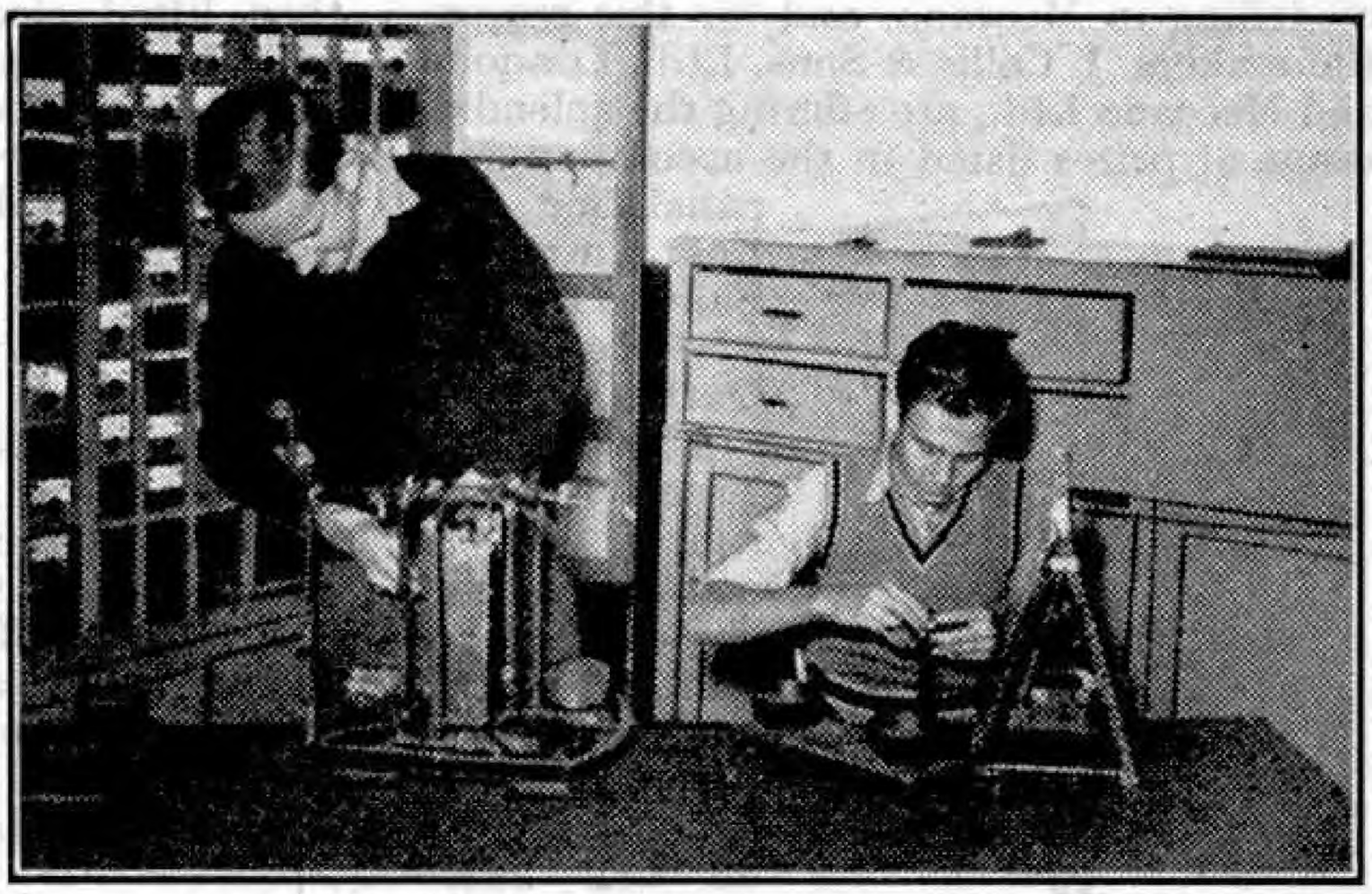
The success of the Maylands Exhibition is another proof of the value of team work in displays of this kind. If a Club is not very large all members can work upon a single scheme, and in larger Clubs each section can work out a scheme of its own, but in any case the co-operation teaches many valuable lessons.

The usual time for Exhibitions of this kind is during December, and preparations should begin immediately. If they are pushed on now progress can be surveyed a week or two before the actual date in order to make sure that nothing has been overlooked. Only when this is done is it certain that events will proceed with the necessary smoothness at the Exhibition itself.

## CLUB NOTES

WATERLOOVILLE, COWPLAIN AND DISTRICT M.C.—The chief feature of the Anniversary Exhibition was a display of models, including the "*Queen Elizabeth*," built by Mr. T. Nicholson, Leader, which was illustrated in the October "*M.M.*" Models built by members included motor lorries and an anti-aircraft gun and there was a Dinky Toys road scene. A Hornby Train layout also was in operation. Club roll: 8. *Secretary:* Mr. B. Jefferson, 12, The Curve, Lovedean, Hants.

MORISON MEMORIAL M.C.—A special display has been planned for 23rd December and the members are busy building models and arranging exhibits for this occasion. A Hornby Train Section has been formed, and the Club has obtained an extensive Hornby-Dublo layout, including both passenger and goods trains and accessories, with which members enjoy splendid fun. Club roll: 19. *Secretary:* Mr. J. Muir, 6, Stanley Street, Clydebank.



**Two members of the Maylands (Perth, W.A.) M.C. at work on Exhibition Models. This Western Australian Club, Leader, Mr. V. Malmgreen, Secretary V. Chester, has a well equipped Club room and a large stock of Meccano parts. It has three sections, which are known as Factions and distinguished by colours, and from time to time special Exhibitions are arranged by the Factions in competition with each other.**

### AUSTRALIA

MAYLANDS M.C.—Intensive model-building work continues in all sections. A great display was made by each of these in a special Exhibition. One Faction built up a splendid fun fair, another a farmyard in which practically every type of farming implement was shown, and the third presented a brickyard. Films have been shown and Games have been played, including base-ball, now the Club's chief Winter Sport. Club roll: 43. *Secretary:* V. Chester, 16, Kennedy Street, Maylands.

## BRANCH NEWS

WITLEY AND GRAYSWOOD—A very successful Exhibition has been held. Visitors numbered 121, and the proceeds amounted to £6/6/–. Members have become interested in television, and a special television evening has been held. *Secretary:* T. Ash, Lower Birtley Farm, Witley, Surrey.

# The Collis Truck

## British Firm Offers Prizes for Meccano Models

By "Spanner"

FROM the time that raw material enters a factory until it leaves in the form of finished goods, it is continually on the move. It is of the greatest importance that the handling operation should be carried out rapidly and easily, otherwise its cost becomes a very serious item in the total cost of producing the finished article.

When quantities of heavy goods have to be handled it is usual to employ some kind of mechanical truck, and in this article we describe a very popular vehicle of this type known as the "Collis" Truck. This truck forms an excellent subject for modelling in Meccano, and for this reason the makers, J. Collis & Sons, Ltd., London, and Meccano Ltd., are offering the splendid range of prizes listed in the accompanying panel for the best models built by owners of Meccano Outfits.

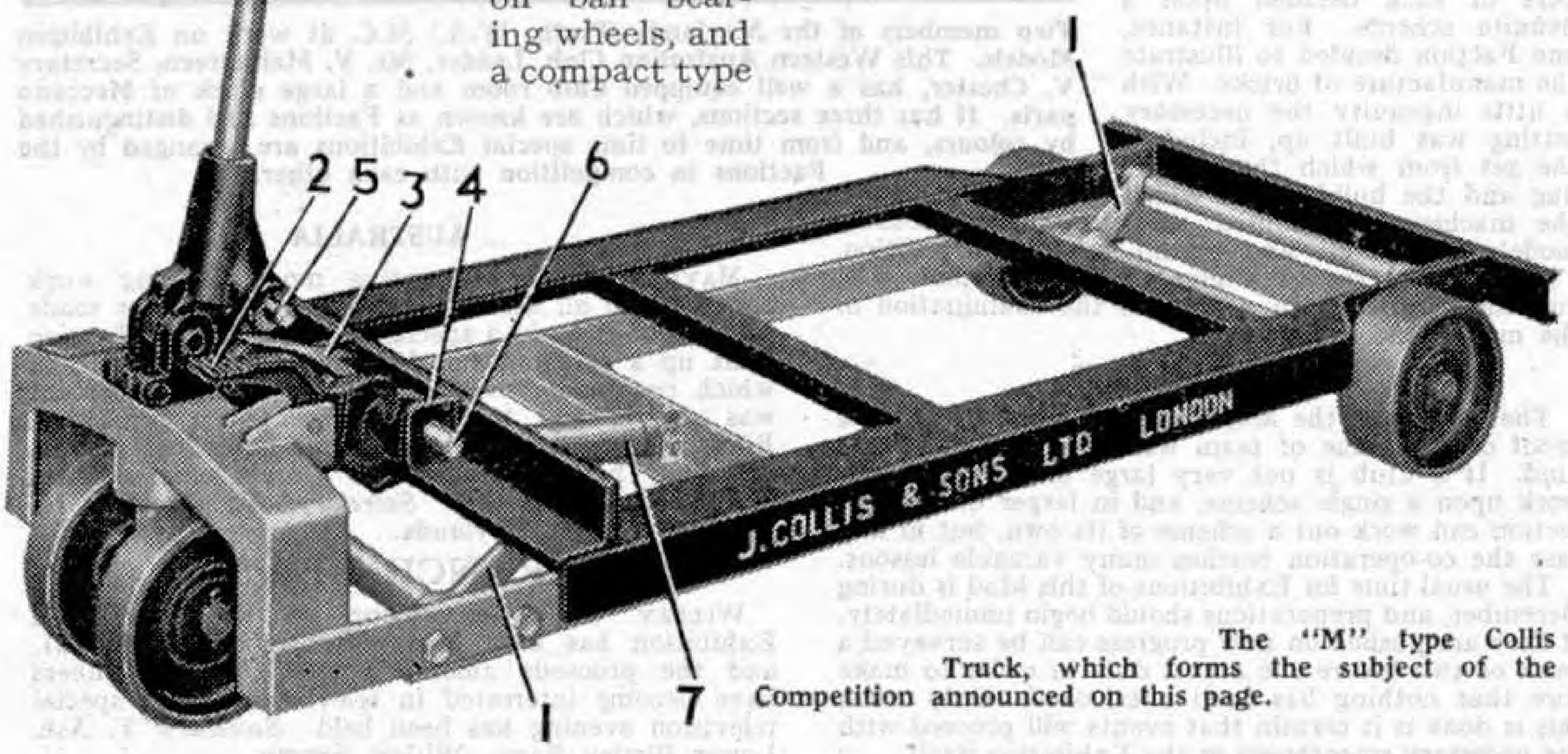
The Collis Truck is very simple. It is rather like the chassis of a motor car, and has no body, but only a frame running on ball bearing wheels, and a compact type of elevating mechanism.

The goods are placed on platforms fitted with skids or runners of the kind shown in one of the accompanying illustrations. These skids raise the platform from the ground sufficiently high to allow a Collis Truck to be run underneath. The design of the platforms varies according to the materials with which they are to be used. For small loose parts, for instance, platforms in the form of a box are used.

When it is desired to move a load the Collis Truck is pushed underneath the platform and the load and platform are then lifted clear of the floor simply by pulling the truck handle downward. When the load has been lifted it can be pulled or pushed anywhere. When the destination is reached, the platform is lowered to the ground just as simply as it was raised.

The Collis Trucks are available in two main types in one of which the load is lifted by means of an interesting hydraulic mechanism, while the other type is entirely mechanical, the load being lifted by means of a simple system of levers.

A Truck of the mechanical type is shown below and it is this Truck that forms the subject of the present Competition. As will be seen the Truck consists of a base frame of steel to which




**The "M" type Collis Truck, which forms the subject of the Competition announced on this page.**

is secured a channel section head. The main frame supports the axle for the rear wheels, and the front wheels are housed under the head and connected by a wheel fork through the head to the handle lever, thus providing a steering mechanism. Just behind the head is a further axle connected to the side members of the base frame. To this and the rear wheel axle are fitted the lifting links 1 of the top or lifting frame. The remaining feature of the base frame structure is the angle section tie bar which supports one end of a hydraulic release check 7.

The top frame is connected to the base frame by the links already mentioned, and by means of these the top frame can be raised with an upward and forward movement. This is effected by mechanism mounted between the head and the top frame front bar. A foot pedal 2 is pivoted between two brackets welded to the head, and a yoke 3 is similarly pivoted to a pair of yoke pin eyes 4 on the top frame front bar. The handle assembly is used for hauling, lifting and steering.

The Truck is operated as follows: the foot pedal, which is roughly in the shape of a letter Y, is depressed. This brings the bottom arm of the Y into contact with the under-side of the yoke, and the yoke is then raised. Two claws or hooks on the top of the yoke are now in a position that will permit the handle lever to engage them with two handle lever pins, the right-hand one of which can be seen at 5 in the illustration. The foot pedal can now be released, and a single forward pull on the handle will lift the top frame to its topmost position. When this position is reached, the yoke pin 6 comes into contact with the top arm of the foot pedal, and by a cam action allows the hooked shape of the arm to engage behind the yoke pin and hold it securely in position. By this means, a big load can be raised with only a few pounds pressure.

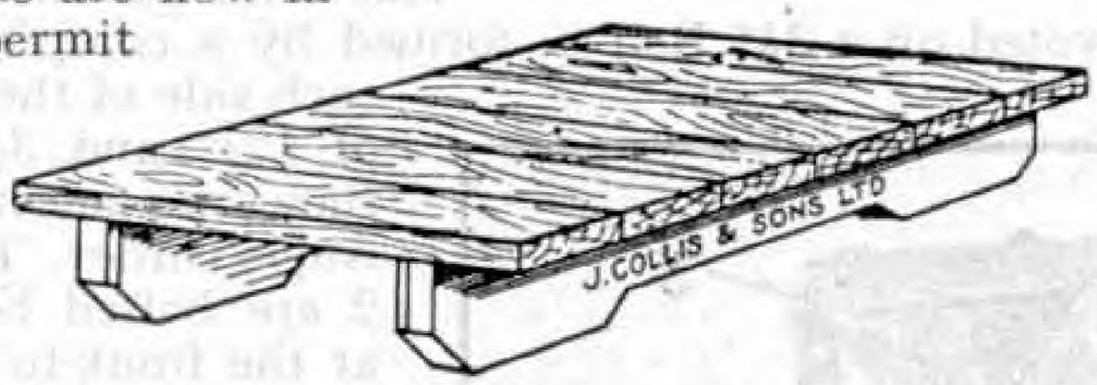
To lower the top frame, it is only necessary to depress the foot pedal, which disengages from the yoke pin, and the top frame then descends under the control of a hydraulic release check 7. This is fundamentally a cylinder charged with oil, and by means of a piston and a suitable arrangement of holes in the piston head, operates as a regulating valve.

## THE PRIZES

**The following prizes will be awarded in each Section of the competition:**

**First Prize, Cheque for £5/5/-.**
**Second Prize, Cheque for £2/2/-.**
**Third Prize, Cheque for £1/1/-.**
**Five Prizes, each of a Cheque for 10/-.**
**Ten Prizes, each of a Postal Order for 5/-.**

**There will also be 40 awards each consisting of a handsome Certificate of Merit.**




**A typical load platform for use with a Collis Truck. Platforms of various types are available to suit different kinds of goods.**

## HOW TO ENTER THE COMPETITION

Meccano boys should be able to build some very fine models of the Collis Truck, and we look forward to a large number of entries. It is not expected that model-builders will be able to reproduce accurately every mechanical detail, and the aim should be to build a model to demonstrate clearly the essential features of the construction, such as the bodywork, lifting links, and steering, etc.

The Competition will be divided into two Sections, A, for readers of all ages living in the British Isles; B, for readers of all ages living Overseas. A competitor's age will be taken into consideration in assessing the merits of his work, and it must be clearly understood that the model must be his own unaided efforts. Entries will be judged by J. Collis & Sons, Ltd., and Meccano Ltd., jointly.

It is only necessary to send either photographs or drawings of models, together with a brief description of their main constructional features. *Actual models will not be accepted.* Each separate photograph or drawing submitted must bear the competitor's name, address and age, and the name of the Contest ("Collis Truck" Competition). Entries must be addressed *"Collis Truck Competition, Meccano Limited, Binns Rd., Liverpool 13."*

Entries for Section A must be sent in before 31st January 1949; entries from Overseas readers before 30th April, 1949.

Photographs or drawings will be returned to the sender if a stamped addressed envelope of suitable size is sent with the entry, except prize-winning entries, which become the property of Meccano Ltd.

# New Meccano Models

## Swing-Boat Tank Locomotive

THE simple model of a swing-boat seen in Figs. 1 and 2 can be built from a No. 3 Outfit. The model is shown operated by a Crank Handle, but if desired it can be driven by a *Magic* Motor.

The base consists of two 12½″ Strips. The swing-boat is supported at each side by two 5½″ Strips, which are joined at their upper ends by a Semi-Circular Plate, and bolted at their lower ends to Trunnions and Flat Trunnions fixed to the base. The Trunnions are connected by a 2½″ Strip, and the Flat Trunnions by a 2½″ Strip and two Angle Brackets.

The bottom of the swing-boat is a 5½″ × 2½″ Flanged Plate, and the sides are 5½″ × 2½″ Flexible Plates. Its ends are 2½″ × 2½″ Flexible Plates, and they are connected to the sides by 2½″ × ½″ Double Angle Strips 2. The framework of the roof consists of 5½″ Strips 3 attached by Angle Brackets to 2½″ small radius Curved Strips. It is bolted to 2½″ Strips fixed to the sides. The roof is a 4½″ × 2½″ Flexible Plate extended by a 1 11/16″ radius Curved Plate, and it is attached to the framework by Angle Brackets.

The swing-boat is pivoted on a 3½″ Rod mounted in the Semi-Circular Plates. This Rod carries two 1″ Pulleys, which are fitted with Rubber Rings and arranged to press against the Strips 3.

The outer end of the 3½″ Rod carries a 1″ Pulley, to the boss of which an Angle Bracket 5 is bolted. The Angle Bracket is extended by a Fishplate, to which a compound strip 4 is lock-nutted. The strip 4 is made by joining together two 2½″ Strips, and its lower end is lock-nutted to a Bush Wheel fixed to a Crank Handle journalled in 2½″ small radius Curved Strips 1 bolted to the vertical supports.

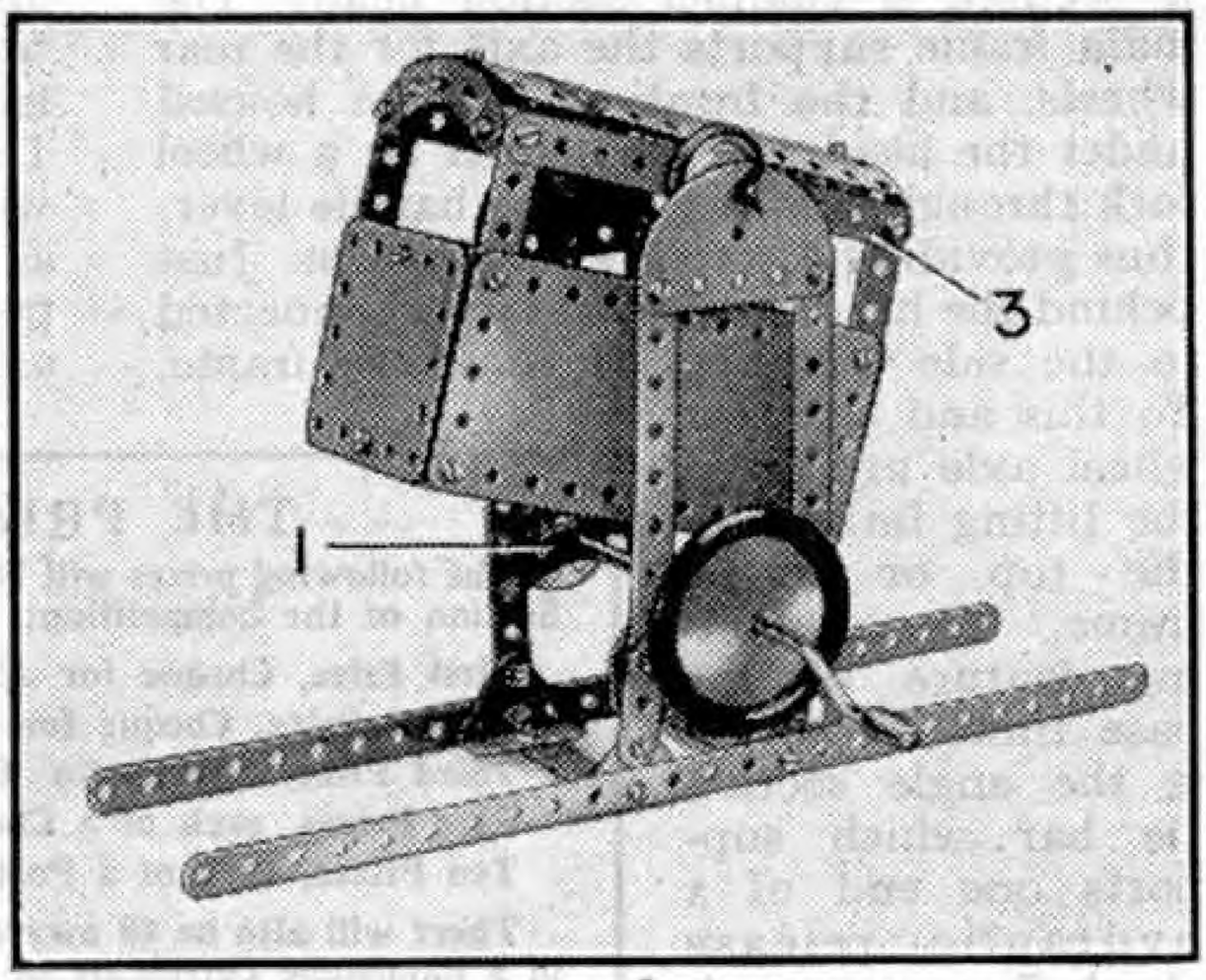



**Fig. 2. Another view of the Swing-boat.**

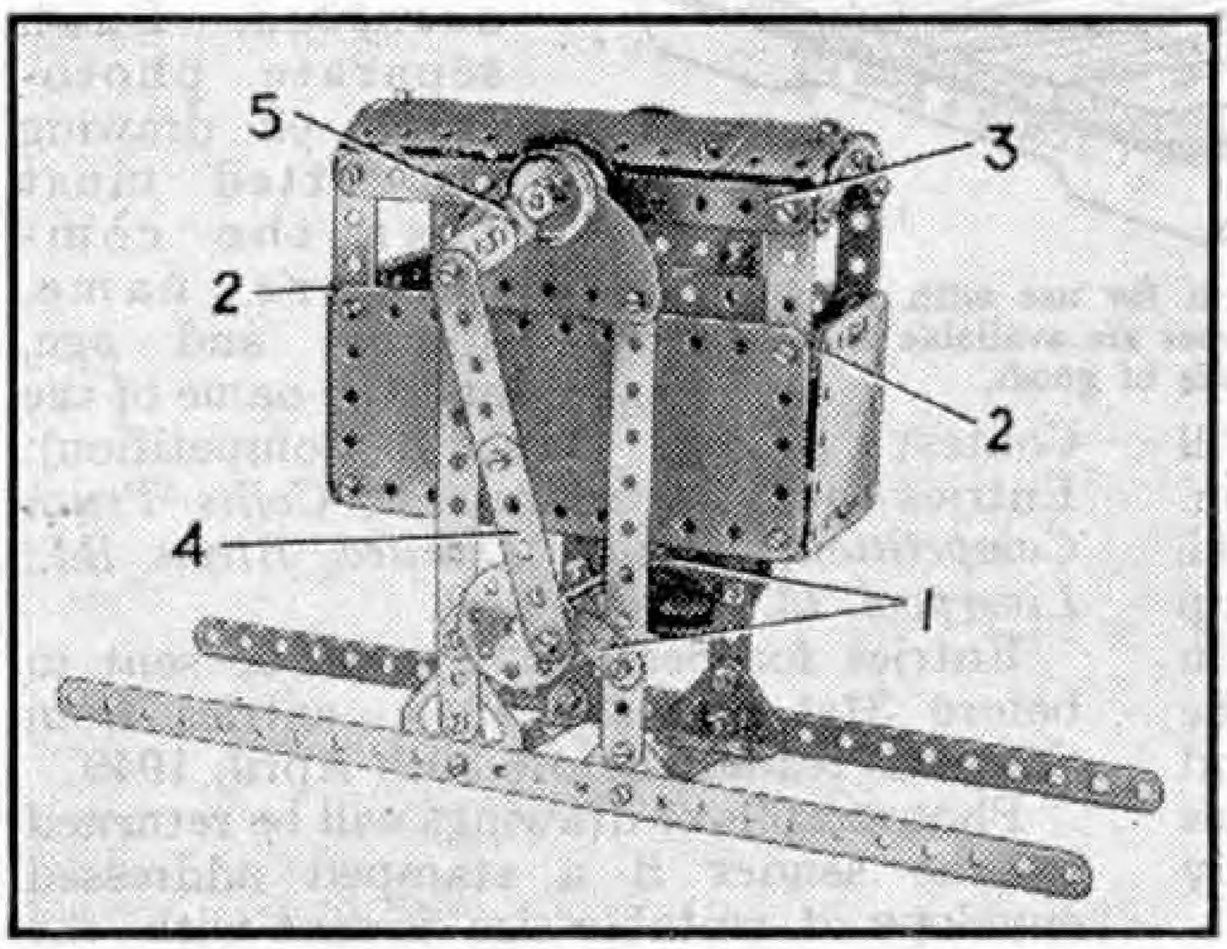



**Fig. 1. A simple model Swing-boat that can be built from Outfit No. 3.**

Our other new model is the fine locomotive shown in Figs. 4 and 5. This is based on a type of 4–6–2 tank engine used for local passenger and goods traffic.

The main frames of the locomotive are formed by a compound angle girder 1 on each side of the model. These consist of 12½″ and 3½″ Angle Girders and they are connected at each end by a 3½″ Angle Girder. Two 12½″ Angle Girders 2 are bolted between the girders 1, at the front to the 3½″ Angle Girder, and in the centre to 3½″ Strips bolted across the girders 1.

The sides of the water tanks and the coal bunker consist of 5½″ × 2½″ and 3½″ × 2½″ Flexible Plates respectively. These are bolted to 9½″ Angle Girders 5, and the 5½″ × 2½″ Flexible Plates are strengthened by 5½″ and 2½″ Angle Girders, while the 3½″ × 2½″ Flexible Plates are braced by 3½″ and 2½″ Angle Girders. The front and rear of the coal bunker are each represented by a 3½″ × 2½″ Flexible Plate.

The forward section of the boiler

is made by curving four $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates around two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips to form a cylinder. The rear section consists of two $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates bolted together and to the cylinder. The edges of the $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates

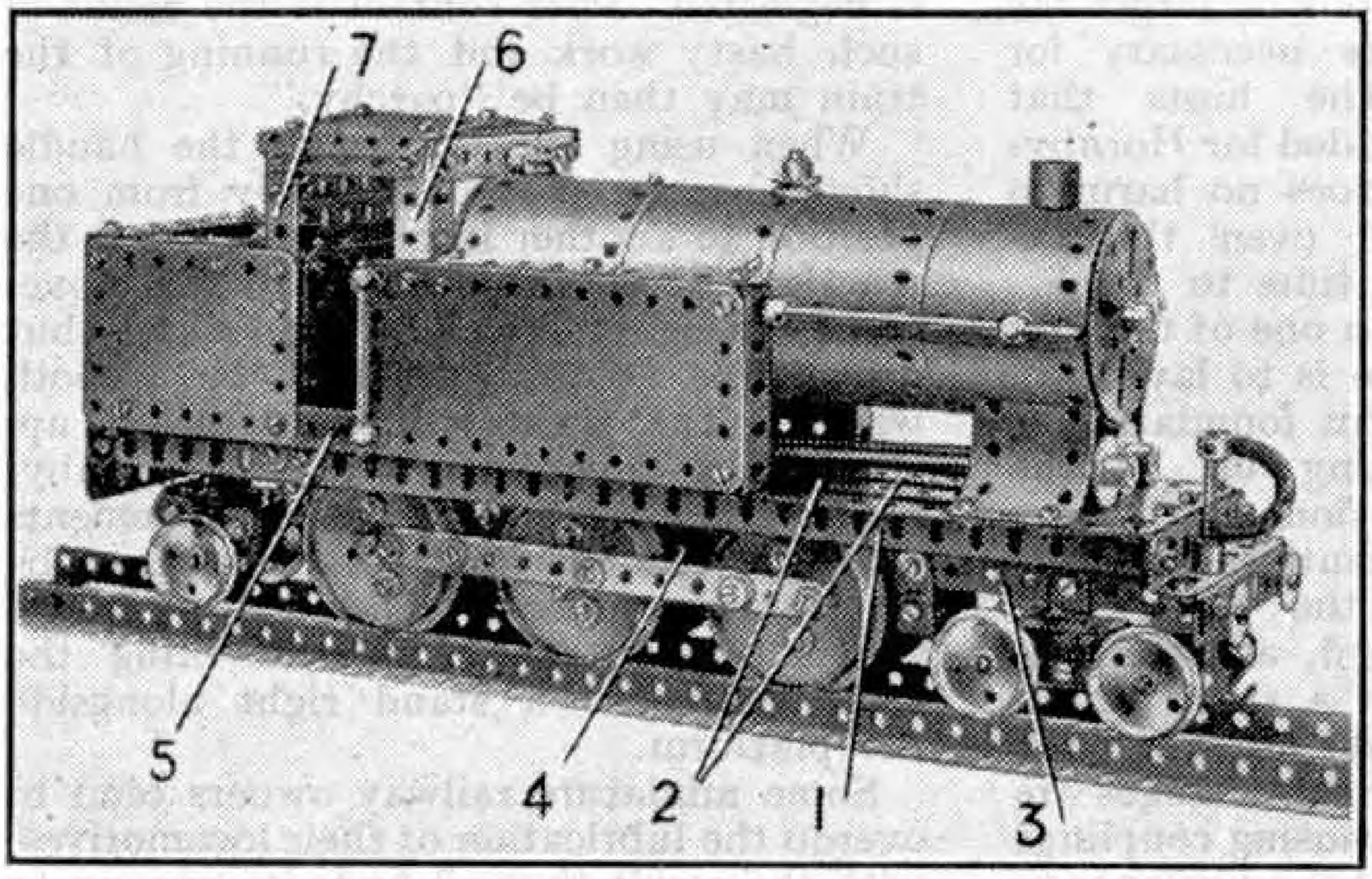



**Fig. 3. This fine 4-6-2 type tank locomotive makes an interesting subject for a working model.**

are attached to the tops of the water tanks. The front of the boiler is supported by a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate bent as shown and fixed to the girders 1.

The cab roof is supported by four 2" Angle Girders, two of which are seen at 6 and 7. The Girders 6 and 7 are connected by a $2\frac{1}{2}''$ Angle Girder, and joined to the Girders on the opposite side by $3\frac{1}{2}''$ Strips. The roof is a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate curved slightly and bolted in position. The back of the cab is filled in by $3\frac{1}{2}''$ Strips, and the rear of the boiler by a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and a Semi-Circular Plate. The floor is a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate.

A $12\frac{1}{2}''$ Flat Girder 3 is bolted to each of the Angle Girders 2, and extended downward by a $9\frac{1}{2}''$ Flat Girder 4. The Flat Girders 4 provide bearings for the driving wheels, which are made by bolting Wheel Flanges to Face Plates. The Flat Girders 4 are connected by three $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 8.

The driving wheels are fixed on $2\frac{1}{2}''$ Rods and spaced from the Flat Girders 4 by Washers. The wheels on each side are linked by a connecting rod formed from two $5\frac{1}{2}''$ Strips overlapped nine holes. The connecting rods are pivotally attached to the wheels by $\frac{3}{4}''$ Bolts and spaced by Collars and Washers.

The front bogie is made by bolting a $2\frac{1}{2}''$ Strip to each of the lugs of a $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. The $2\frac{1}{2}''$ Strips are spaced inward by four Washers. The wheels are $1\frac{1}{8}''$ Flanged Wheels fixed on 2" Rods mounted in the $2\frac{1}{2}''$ Strips. The bogie is attached to the leading Double Angle Strip 8 by a $2\frac{1}{2}''$ Strip held by a lock-nutted bolt.

The rear bogie is made by bolting $1\frac{1}{2}''$ Flat Girders to the lugs of two $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips. The Flat Girders are spaced inward by four Washers, and the wheels are fixed on a 2" Rod mounted in the Flat Girders. The bogie is bolted to a $2\frac{1}{2}''$ Strip lock-nutted to the rear $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 8.

The front buffer beam is built up from two $3\frac{1}{2}''$ Angle Girders, and the buffers consist of $\frac{3}{4}''$ Washers and Washers placed over $\frac{3}{8}''$ Bolts. The vacuum pipe is a Spring passed over a $1\frac{1}{2}''$ Rod held in a Rod Socket. The rear buffer beam is a $3\frac{1}{2}''$ Flat Girder.

The smoke-box door is a Face Plate fitted on a Threaded Pin attached to the centre of the $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip at the front of the boiler. The chimney is a Chimney Adaptor and a $\frac{1}{2}''$ Pulley is used to represent the steam dome.

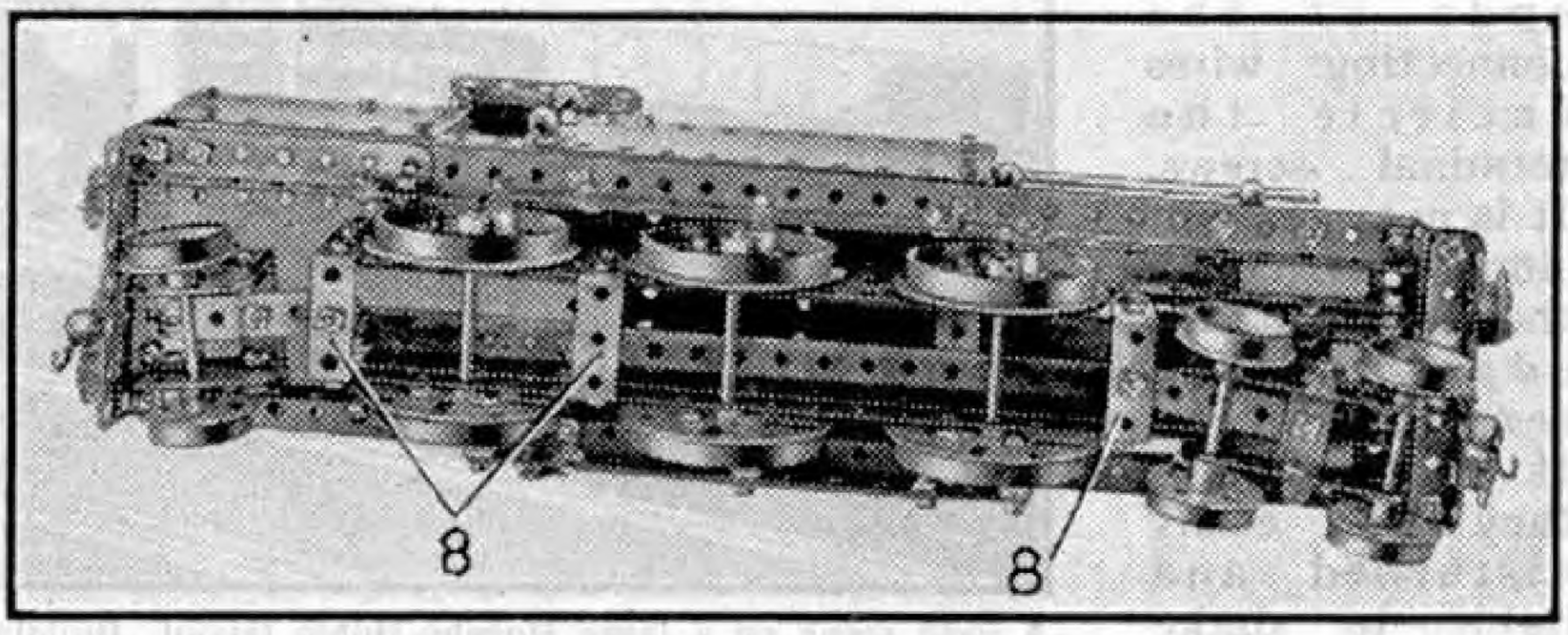



**Fig. 4. The model locomotive seen from underneath.**

# Hints for Hornby-Dublo Beginners

OWNERS of Hornby-Dublo trains, especially new ones, are usually so anxious to get on with their train running that they are apt to overlook or forget the simple measures that are necessary for successful operation. The hints that follow are principally intended for Hornby-Dublo beginners, but it does no harm to refresh the memories of even the experienced operators from time to time!

In order to run our train one of the first things that we have to do is to lay down the track. A flat and firm foundation is necessary and the joining up of the individual rails must be done with care. It is important that the centre connecting clips fitted underneath the track base should be properly engaged, as otherwise there is the possibility of a short circuit occurring. There should not be any abrupt changes of level. Such changes are apt to be troublesome by causing couplings to become disconnected. It is a nuisance to have to attend to uncouplings in the middle of a train journey. Uneven track is also liable to cause derailments, which are aggravating when one is "showing off" the railway to friends!

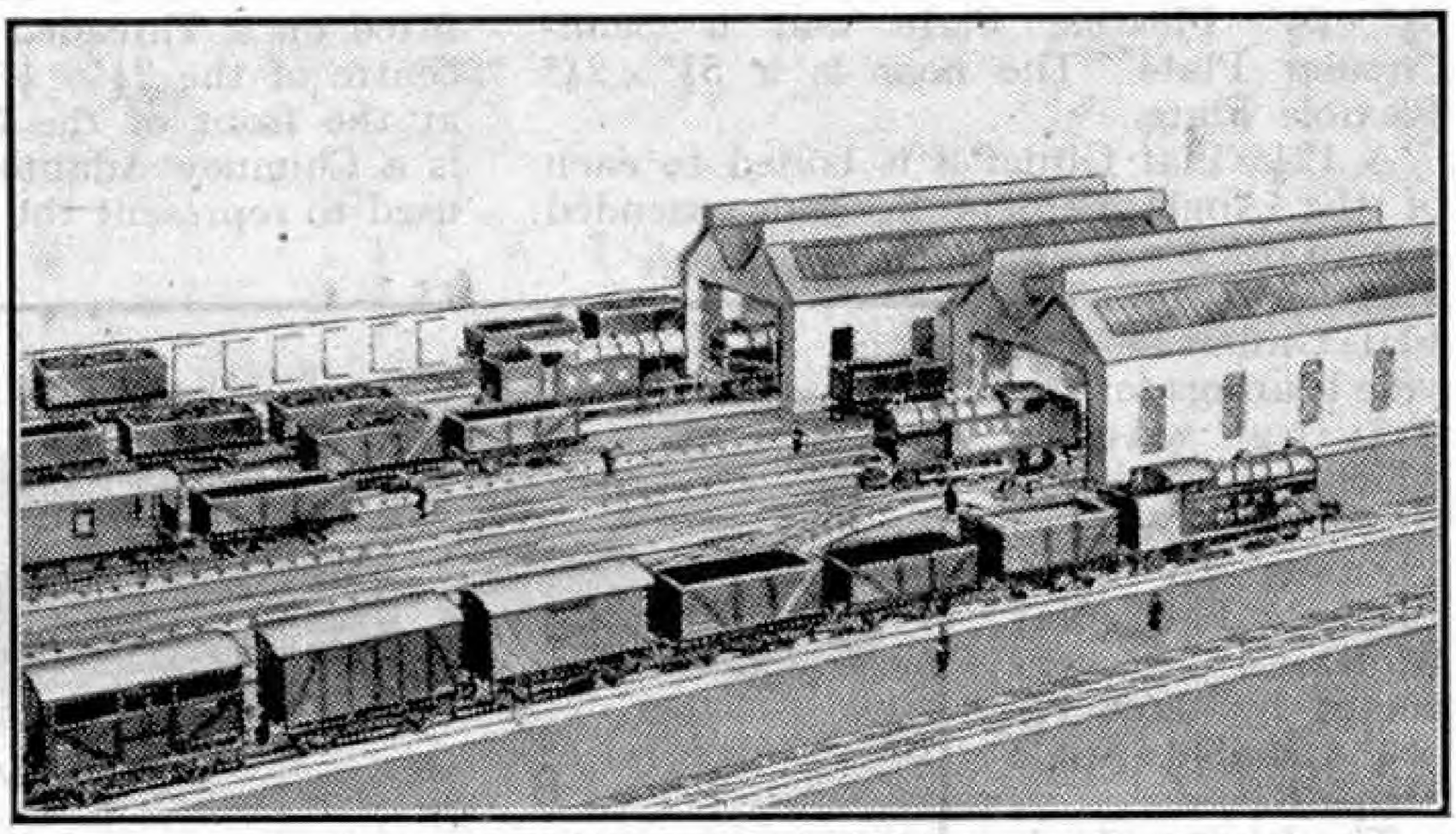
For good running the rails should not be out of line or irregular in formation. What are often referred to as "dog-leg" joints look bad and will lead to unsatisfactory running and possibly even to derailments.

With the track in order, the electrical connections from the Transformer to the Controller and from the latter to the Terminal Rail, should be made exactly in accordance with the instructions packed with every Hornby-Dublo Train Set. We should always see that the looped ends of the connecting wires encircle the terminal screws. It is not sufficient simply to clamp them under the edge of the terminal nuts. If this is done, they are easily disturbed and liable to shake loose in the course of operation. It may seem obvious that the terminal nuts should be done up tightly, but it is surprising how often this is neglected. Poor contact is the result of such hasty work and the running of the train may then be "patchy."

When using the Controller the handle should not be moved violently from one position to another in order to try out the reactions of the locomotive, for the movements then produced are anything but railwaylike. Control should be smooth whether the train is being started up, stopped or reversed. With the Hornby-Dublo Controller, the easy movements characteristic of real practice can be exactly reproduced. There is a lot of satisfaction in being able to bring the train gently to a stand right alongside the platform.

Some miniature railway owners tend to overdo the lubrication of their locomotives, with the result that oil finds its way on to the wheels and on to the track. This causes slipping of the driving wheels and interferes with electrical contact. On the other hand, the lubrication of rolling stock is apt to be neglected. The performance of these vehicles will be far better if a tiny drop of oil is placed on the axle bearings outside the wheels.

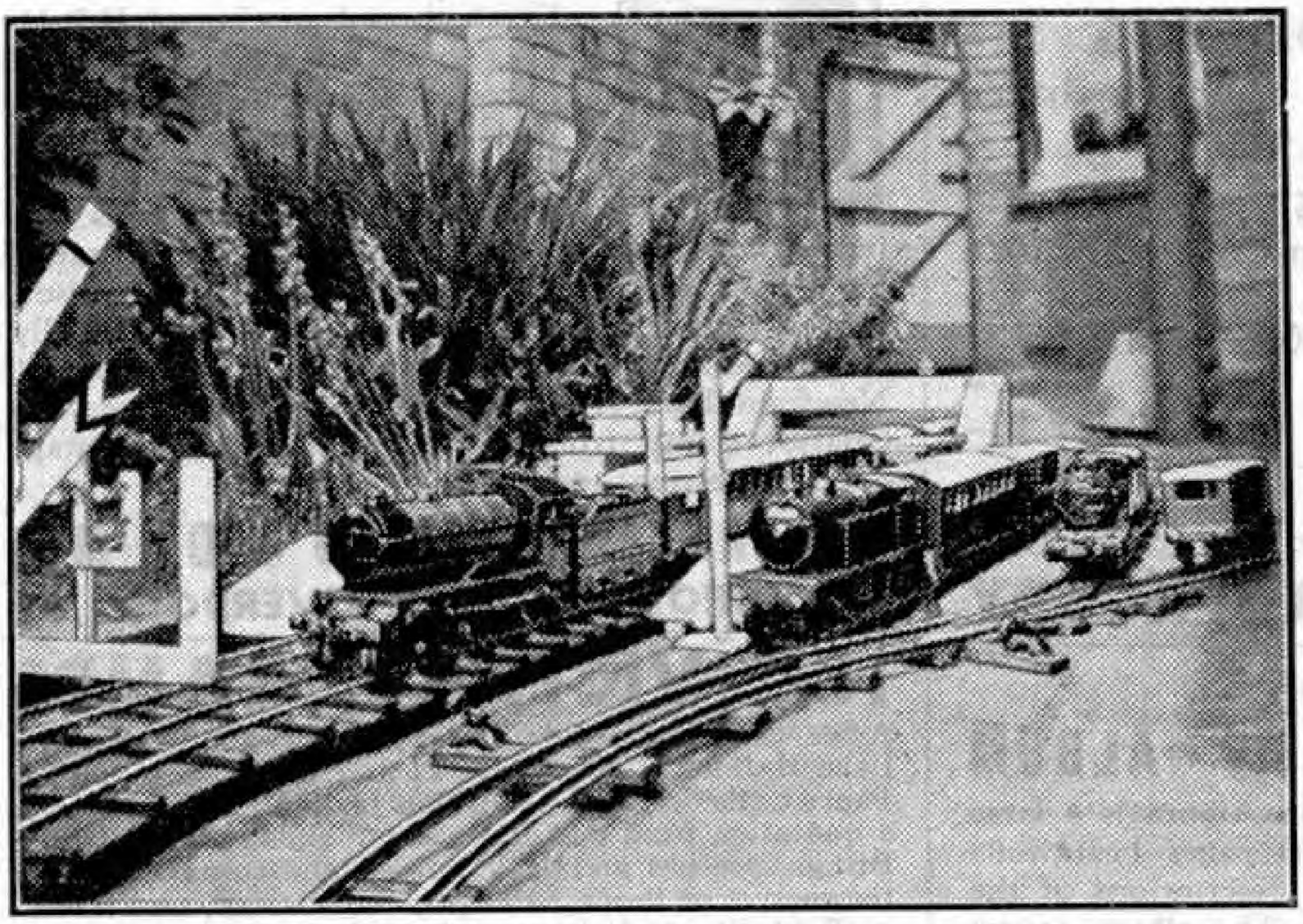
A thick oil should never be used for miniature railway lubrication purposes. When the supply in the oil bottle packed with each Hornby-Dublo Train Set has become used up, a light oil of sewing machine quality should be obtained.



A yard scene on a large Hornby-Dublo layout. Buildings such as the engine sheds shown can be constructed at home in wood or card.

# A Hornby Clockwork Layout

THE illustration shows part of the Gauge 0 miniature railway system operated with Hornby Clockwork Locomotives by Mr. A. E. Clarke, of Leicester, and his son. For photographic purposes, a section of the railway was posed out of doors, but normally the system is an indoor one. As the railway began during the later years of the war, all the stock and equipment was obtained secondhand or constructed at home.



**Part of the railway of Mr. A. E. Clarke, Leicester. The system is operated with Hornby Clockwork Locomotives.**

The layout is not permanently installed, but the track is arranged in sections for easy assembly and subsequent dismantling. The sections are marked to ensure that they are always assembled in the same order. This saves time and trouble.

The layout consists of a double-track oval main line with a passing station of the fairly important main line type. Part of the platforms, buildings and footbridge of this can be seen in the photograph. A trailing crossover connects the inner and outer tracks, and there is an inner platform line and two sidings. These three roads are shown on the right-hand side of the photograph. The actual track is a combination of Hornby tinplate and scale steel permanent way.

The railway began operations with two Hornby No. 1 Clockwork engines. One of these is still on the "Company's" books, although at the time of writing it is undergoing repair. Later a Hornby No. 2 Special Clockwork L.M.S. 4–4–2 Tank was purchased, and for some time it took the bulk of the hard work on the line. The opportunity then came of buying a Hornby No. 2 Special Clockwork tender engine. This was an L.N.E.R. 4–4–0 named "*Yorkshire*," which was in excellent condition.

Operation of the railway varies week by week, but regular passenger traffic usually begins by the running of a "Down Express," supposedly from one town to another via an intermediate junction. On this layout of course the one station has to do for all three places in turn, and the names of the places are changed weekly. Before this, however, it is usual to run an "empty stock" train three or four times round the track. The normal load for this train is four passenger coaches and one van, which is found to be the best load for either engine. The train is first run by the L.N.E.R. engine, while the L.M.S. Tank is working a "through goods" train on the "Up" line. Then the engines exchange duties, and later the reverse runs are made. After the first return journey the passenger train is often divided into two local trains with the addition of a few vans to make up the loads.

To make return working possible the goods train is generally run with a Brake Van at each end. The usual load is between 8 and 12 vehicles, but quite good running is made with 14, including a double-bogie low-loading vehicle. There are various types of wagons and vans, some of which are of Hornby make while others have been reconstructed at home from old stock.

The signals are mostly home made, being constructed with square steel posts, steel bases and with arms and fittings made from strip copper or brass. Other signals are Hornby.

*For other Stamp Advertisements see also pages 404 and xi.*

# Stamp Collecting

## A Splendid Flower Issue

By F. Riley, B.Sc.

IT s a pleasure to turn at times from the standard stamp issues of portraits, conventional designs and commemoratives to spend a few minutes in one or other of the byways of the collecting hobby. A delightful set of stamps issued in Austria in May last provides us with an excellent opportunity. This is a charity set, each stamp having a special charge beyond its postal value, and the extra money raised by their sale is being devoted to an anti-tuberculosis fund. The designer had the happy thought of illustrating on the stamps the common flowers of his country. His drawings have been beautifully engraved, and the result is an extremely attractive issue. There are 10 stamps, each in three colours, and these will charm all who see them well arranged and mounted.


Some 12,000 species of plants grow in Austria, and about a third of these are flowering plants, so that there was ample scope for producing attractive designs. Some of the subjects will be familiar to British readers, as the flowers are common here also. The "Veilchen" or violet is one of these. It is shown on the lowest value, 10+5g., with the flowers themselves in their proper colour, green leaves and a deep mauve background. Another well-known British wild flower, the anemone, or "Buschwindroschen" to give it its German name, is represented on the 20+10g. stamp, the simple white flowers with their yellow anthers showing up well on a green background. The primrose is the subject of the 40+20g. design, and this too is a flower that needs no description for British readers; while the flower shown on the 75+35g. stamp will be recognised as the wild rose.


Two other flowers represented in this set also occur in this country, but are not at all common. One of them is the bright blue wild cyclamen, known in Austria as the "Alpenveilchen" or "Zyklame," the latter name actually appearing on the stamp. The other is the pasque flower, which in Germany and Austria is called the "Küchenschelle" or cow-bell; the colour of this flower is reddish violet.


The remaining four flowers are not natives of Great Britain. On the 60+30g. stamp the deep red "Alpenrose" is shown. The three colours of this stamp are the red of the flower, the green of its leaves and a deep magenta background, and the general effect is very striking. The gentian, a bluish violet alpine flower, is seen on the 1s.+40g. stamp, and that famous alpine plant the edelweiss is the subject of the highest value of all, 1s. 40g.+70g. Edelweiss does not occur naturally in Great Britain, but is easily grown in our gardens. Its little white flowers seem to grow best in inaccessible places on the mountain sides, and it has always been a great attraction for climbers. The 30+10g. illustrates the crocus, known here only as a garden flower.


This very fine set undoubtedly provides the finest flower stamps that have yet been printed. There have been many attractive previous examples, however. One of these was also an Austrian product, issued in 1937 in two values, 12gr. and 24gr., as a form of Christmas greeting. Its design showed roses in a vase, with the signs of the Zodiac on the right and left of the stamp. Two other famous examples come from Central American countries. In 1937 Costa Rica issued a series of stamps to commemorate a National Exhibition, held in San Jose, the capital; and another series for the same purpose that appeared in 1938 included one showing an orchid. This was a 1c. stamp in violet and green and was noteworthy because of its diamond shape. Guatemala has a national flower known as the White Nun, and this appeared on the 2c value of that country's issue of September 1939.

British Guiana also is represented in the stamp flower collection by a representation of the well-known Victoria Regia lily, a giant aquatic plant. For further examples we can look to Bulgaria, where roses are grown on a very large scale and used in making attar of roses. This industry is distinguished by a stamp, the 2l. value of a 1938 issue devoted to various agricultural products. The colour of the stamp is carmine and the central feature of the design is a large rose. Other roses are shown on the 7c. value.

The country that has issued the greatest number of stamps with a flower connection is Japan, and as readers will realise at once, the flower in this case is the chrysanthemum, a formal representation of which appears on most Japanese stamps.

*For other Stamp Advertisements see also pages 402 and xi.*

# Stamp Gossip

## and Notes on New Issues

By F. E. Metcalfe

THOUGH Gibbons K.G. VI catalogue came out at the end of August, this is the first opportunity we have had to review it. The catalogue on the whole has given a good deal of satisfaction to collectors of colonial stamps of the present reign. The first point to be noted is that at long last collectors in general have been able to procure an authoritative catalogue, and this really is something, for Gibbons' catalogues have been so scarce since early in the war that copies of the colonial section which were published at 12/6 made over £6 a copy in auction.


Some of the prices in the new edition are startling, and one or two of them will give satisfaction to "*M.M*" readers if they took advantage of the tips we have given from time to time. For instance, when we first mentioned it the 1d. red Barbados (perf. 13½ × 13) was obtainable for a few coppers, mint; it is now catalogued at 35/– and is well worth this price. Another favourite was the 1½d. Montserrat (perf. 13). We were prompted at the time this stamp was mentioned by seeing mint copies offered at 5d. by a dealer. It is now listed at 15/–, and it will cost at least that sum to buy one.

Not all collectors will be satisfied with Gibbons' new venture. That would not be possible, but on the whole they have done a grand job and collectors will be well advised to get copies while they are still obtainable. If by so doing they are induced to take up collecting the stamps of the present reign, it is the opinion of one old hand, at any rate, that they could not invest their pocket money in a sounder way.

Collectors have often wondered why Canadian stamps did not rise quickly in price once they became apparently obsolete. The reason was that while they were no longer on sale at the various post offices up and down Canada, most of them were still obtainable at the Government Philatelic Bureau for quite a long time after their withdrawal. Until quite recently it was possible to obtain copies of odd stamps dating back to the King Edward VII era, but all that is going to be changed, according to an official announcement. Now stamps will only remain on sale in the Bureau for two years after removal from post office counters. Moral, fill your mint Canadian blanks as soon as possible, for the stamps of few countries are more popular than those of our Dominion, and stamps to-day costing a shilling or two, or even a few pence, will cost many times that sum in a year or two.



While on the subject of Canada we may as well refer to our first illustration of the month, one of the ubiquitous commemoratives of the U.S.A., which has been issued to commemorate the century of peace between Canada and the United States. What a different world this would be to live in if all countries were able to celebrate similarly.

It was to be expected that several countries would use the Olympic Games in London as an excuse for a special set of stamps. Peru was one of these, and we are showing an air stamp in a rather effective design, which is one of a set of four. It will be noticed that the game basket-ball is depicted, a game that is very popular in both North and South America. As spectators at the Olympic series were able to see for themselves, as a spectacle few sports can beat it. The U.S.A. team won the title and their team were a most impressive sight. One of the players actually measured seven feet, and when he got near the basket he could almost pop the ball in.

More than one collector has asked what Palestine is doing in the way of new stamps, and the short answer is plenty. Prior to taking over their own post office, the inhabitants of Palestine sold a number of labels for various charitable purposes, and when they obtained control these were crudely overprinted and used for postage. A definitive set also was placed on sale, and we are illustrating one of these. The ornament in the centre is, well what? Yes, you are right, a shekel. Collectors of Palestinian stamps can look forward to many additions to their collections in future if they can get hold of the stamps, but now that the country is outside the sterling area this may not be easy.

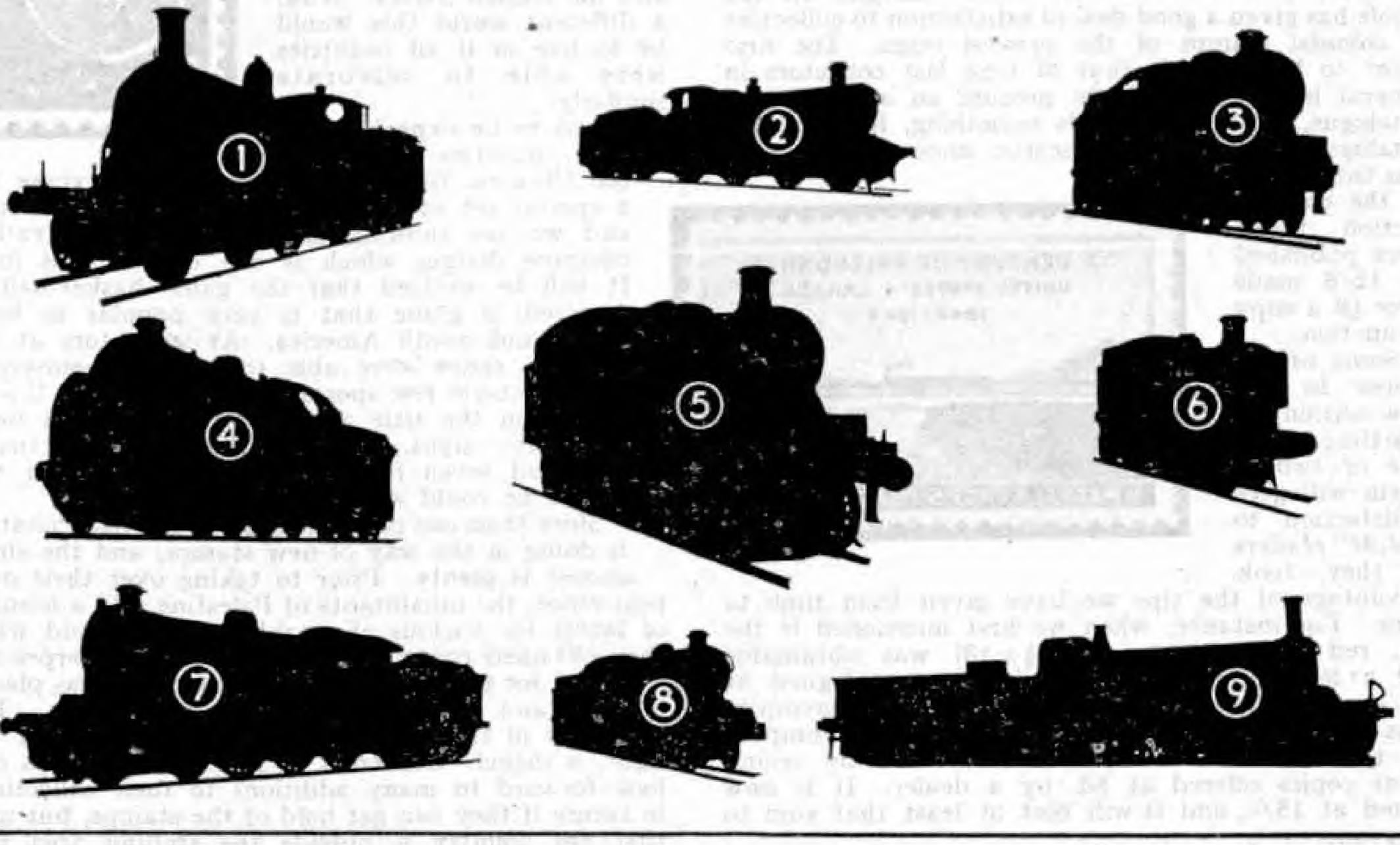

Our fourth and last illustration this month is that of a handsome stamp that is part of a set of 12 issued during the summer by Abyssinia. The stamps were printed in London by Messrs. Bradbury Wilkinson and Co., and altogether they are an attractive lot, each one showing a view of the country which has issued them, with the Parliament Buildings in Addis Ababa, the capital, on the 12c. value. A portrait of the Emperor Haile Selassie is inset on each stamp. Unfortunately it is a rather expensive set, but odd values may be picked up from time to time, for a copper or two.

Speaking of cheap stamps, a collector asked the other day what country in the British Empire he could collect without spending much money. South Africa was suggested to him, and if you are satisfied to collect separated pairs, a very nice showing of used can be picked up for very little. Lovers of shades will find ample scope, and dealers usually can offer a nice selection. Most stamps will be priced at coppers. If a collector wants more scope than a single country can provide, he can take in used Canada, New Zealand and Australia. All have plenty of cheap stamps to offer, and if nice copies only are selected—this is very important—a worth-while collection can be got together easily and cheaply.

# Competitions! Open To All Readers

*Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.*

## Do You Recognize These Engine Shadows?




The illustration on this page shows nine "Locomotive Shadows." Some of these silhouettes will be recognized easily. Others may require more careful examination, but all should be identified by keen "*M.M.*" readers. When this has been done, the class, wheel arrangement and former owning company of each engine should be written out in the form of a numbered list for despatch as an entry in this month's chief competition. These entries should be addressed to "*November Locomotive Shadows Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Every competitor should take care to put his name and address on each sheet of his entry.

The competition will be divided into two sections, for Home and Overseas readers respectively, and in each there will be prizes to the value of 21/–, 15/– and 10/6 for the best entries in order of merit, with Consolation Prizes for other good efforts. The judges will take neatness and originality into account in the event of a tie for any prize.

Closing dates: Home Section, 31st December 1948. Overseas, 30th April 1949.

## Firework Yarns Wanted

Within a few days most of our readers will be enjoying the delights of the Fifth of November, the traditional date for lighting bonfires and setting off rockets and all kinds of fireworks. Practically every reader will have had some exciting or interesting experience in connection with fireworks. Some of these may have landed their victims into a scrape, others may have been just funny. Whatever their kind, it is true stories connected with "the Fifth" that are asked for in our second competition this month.

Entries in this contest are limited to 300 words each. Competitors are not asked to regard this as an essay, but simply to write a letter to the Editor telling the actual story. Prizes of £1/1/–, 15/– and 10/6 will be awarded to the three best and most interesting letters received in each of the two sections into which this Contest is divided, for Home and Overseas readers respectively.

Entries must be addressed "*November Story Contest, Meccano Magazine, Binns Road, Liverpool 13.*" The closing dates are 31st December in the Home Section, and 30th April 1949 in the Overseas Section.

## November Photographic Contest

In the 11th of our 1948 Photographic Contests the motor car and the motor cycle are our subjects. Any photographs showing cars or motor cycles will be suitable for entry, so that there should be ample opportunity for every reader interested in photography to take a picture that will be suitable. It is not necessary to include figures, but entrants will be well advised to do this and to provide a suitable background in order to give a satisfactory pictorial effect.

There are only two conditions, but these must be observed by all entrants. The first is that the photograph must have been taken by the competitor, and the second that on the back of the print must be stated exactly what the photograph represents.

Entries will be divided into two sections, A for readers aged 16 and over and B for those under 16. They should be addressed "*November Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be separate sections for Overseas readers, and in each section prizes of 21/–, 15/– and 10/6 will be awarded. Closing dates: Home Section, 30th November; Overseas Section, 31st March 1949.

# Competition Results and Solutions

### JUNE 1948 CROSSWORD CONTEST

1st Prize: T. Hill, Bolton. 2nd Prize: R. H. Taylor, Glasgow, W.1. 3rd Prize: L. A. Perry, Cradley Heath. Consolation Prizes: D. A. P. Rice, Newry; T. D. Tasker, Barnsley; D. J. Sims, London S.W.12; D. B. Appleyard, East Ardsley.

### JUNE 1948 SPORTS CONTEST

1st Prize: S. H. Saunders, Pinner. 2nd Prize: D. W. Leaman, Brixham. 3rd Prize: B. Clark, Gateshead, 8. Consolation Prizes: D. Barrington, Gravesend; A. J. E. Lloyd, Ewelme; K. Tinning, Birkenhead.

### JUNE 1948 PHOTOGRAPHIC CONTEST

1st Prize, Section A: S. S. Pethybridge, Newton Abbot; Section B: D. Hudson, Purley. 2nd Prize, Section A: J. Mc. M. Neish, Glasgow C.3; Section B: J. W. Hind, Nottingham. 3rd Prize, Section A: B. Watson-Jones, Manchester; Section B: R. Grandison, Dundee. Consolation Prizes: C. E. Wrayford, Bovey Tracey; F. G. Reynolds, Sidcup; J. M. Taylor, Wolverhampton.

### JULY 1948 BIRD-WORD CONTEST

1st Prize: P. R. Lucas, Stockton Heath. 2nd Prize: C. E. Wrayford, Bovey Tracey. 3rd Prize: N. Trickett, Sheffield. Consolation Prizes: S. A. Williams, Bilston; G. R. Trevise, Norwich; A. Martens, London W.C.2.

### JULY 1948 FIGURE DRAWING CONTEST

1st Prize: K. R. Pargeter, Stourbridge. 2nd Prize: J. A. Shepheard, London N.10. 3rd Prize: T. Hill, Bolton. Consolation Prizes: Miss J. Goodwill, Liverpool 19; G. B. Marshall, Christchurch; W. D. Balch, Keighley.

### JULY 1948 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. W. Lang, Sevenoaks; Section B: M. Fox, Ilford. 2nd Prize, Section A: H. J. Edwards, Tunbridge Wells; Section B: R. H. Seebohm, York. 3rd Prize, Section A: J. S. Carver, Leuchars; Section B: J. W. Hind, Nottingham. Consolation Prizes, Section A: J. Griffiths, Hengoed; J. H. Taylor, Aberdeen; Section B: P. Shotton, Stafford; P. Clifford, Wembley.

## OVERSEAS

### JANUARY 1948 COVER VOTING CONTEST

1st Prize: A. Jones, Brisbane, Australia. 2nd Prize: H. Hughes, Amsterdam, Holland. 3rd Prize: J. Vernon, Bombay, India. Consolation Prizes: R. B. Hobbs, Kilburn, S. Africa; R. S. Banajee, Bombay 7, India.

### JANUARY 1948 RAILWAY QUESTIONS CONTEST

1st Prize: S. Roydon, Vancouver, Canada. 2nd Prize: B. Keith, Johannesburg, S. Africa. 3rd Prize: J. Goodall, Oslo, Norway. Consolation Prizes: A. Mathew, Cape Town, S. Africa; D. J. White, Christchurch, New Zealand.

### JANUARY 1948 PHOTOGRAPHIC CONTEST

1st Prize, Section A: Miss N. P. Milne, Hawke's Bay, N.Z.; Section B: M. Barton, Colombo, Ceylon. 2nd Prize, Section A: I. Holdaway, Blenheim, N.Z.; Section B: W. Harris, Port Said, Egypt. 3rd Prize, Section A: P. Jackson, Rangoon, Burma; Section B: B. Baxter, Invercargill, N.Z. Consolation Prizes: C. Havenga, East London, S. Africa; D. Paynter, Rosebank, S. Africa; R. Whyte, Dunedin, N.Z.; C. Formby, Johannesburg, S. Africa.

### FEBRUARY 1948 PHOTOGRAPHIC CONTEST

1st Prize, Section A: K. J. Milne, Hastings, N.Z.; Section B: B. K. Aston, Brisbane, Australia. 2nd Prize, Section A: J. F. Little, Wellington, N.Z.; Section B: L. Griffiths, Nairobi, Kenya. 3rd Prize, Section A: T. S. Murch, Georgetown, British Guiana; Section B: J. Ystel, Paris, France. Consolation Prizes: H. G. Roy, Calcutta 12, India; N. V. Murray, Auckland, N.Z.; H. Hwwitz, Cape Town, S. Africa; J. Palmer, Wellington, N.Z.; D. Hicks, B.A.O.R. (2).

### FEBRUARY 1948 FIGURE DRAWING CONTEST

1st Prize: B. Tudor, Colombo, Ceylon. 2nd Prize: T. K. Clifford, Valletta, Malta, G.C. 3rd Prize: H. Wessel, Vienna, Austria. Consolation Prizes: N. Bousfield, Cape Province, S. Africa; L. R. Dickson, Pretoria, S. Africa; B. J. Cowie, Dunedin, S.2., N.Z.

## SOLUTIONS

### JANUARY 1948 COVER VOTING CONTEST

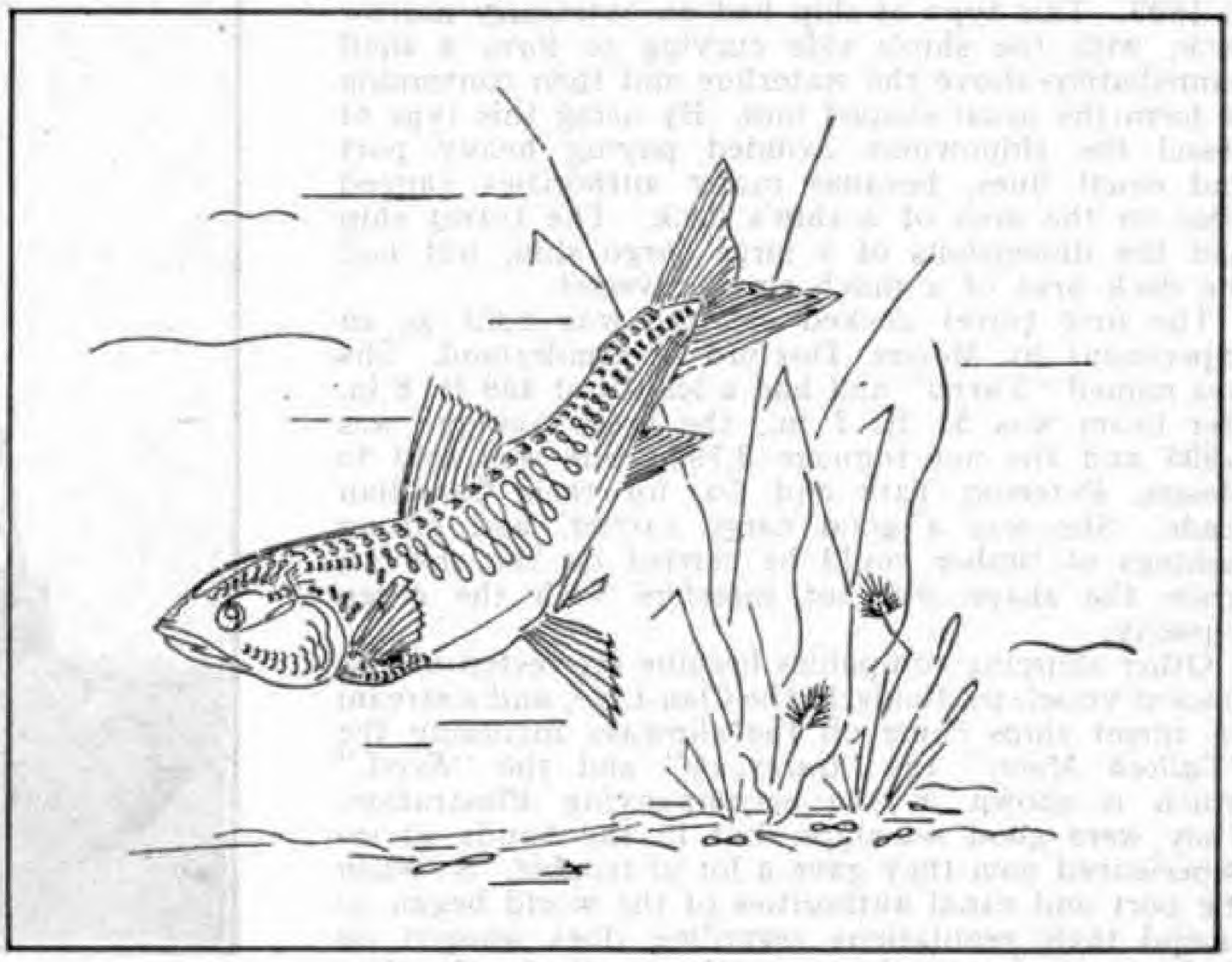
1st. December; 2nd. May; 3rd. April; 4th. September; 5th. June; 6th. November; 7th. October; 8th. August; 9th. March; 10th. February; 11th. January; 12th. July.

### FEBRUARY 1948 LOCOMOTIVE SHADOWS

1. British "Austerity" 2-8-0. 2. G.W.R. "County" Class 4-6-0. 3. L.N.E.R. Ex. North British 4-4-0. 4. L.N.E.R. "Ivatt" 4-4-2. 5. U.S.A. "Austerity" 2-8-0. 6. L. & Y. 4-6-0. 7. L.N.W.R. "18 inch" Goods 0-6-0. 8. L.M.S. "Garratt" locomotive. 9. L.N.W.R. "Claughton" class 4-6-0. 10. SNCF. France. Ex. Nord "Super Pacific."

### MARCH 1948 HIDDEN NAMES CONTEST

Wyddfa, Gazelle, Southern Maid, River Esk, Thornhill, Joan, Greenore, Lugnaquilla, Enniskillen, The Maine, Olderfleet Castle, Galtee More, Tailte, Caledonia.



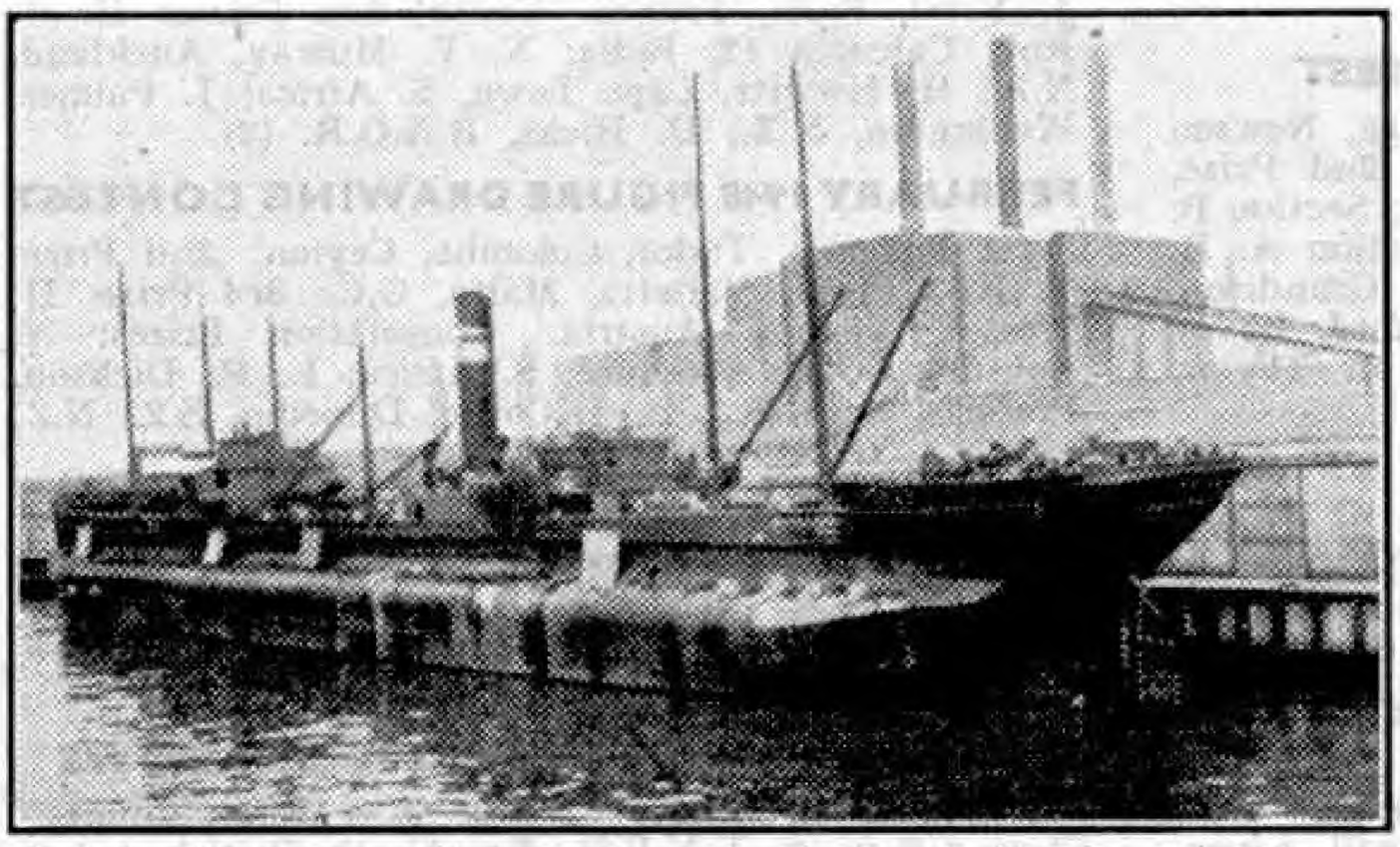
**A very original and excellent figure drawing by K. R. Pargeter, Stourbridge. Awarded 1st prize in the July 1948 Figure Drawing Contest.**

# From Our Readers

*This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.*

## TURRET SHIPS

Shortly after experiments had been carried out on the relative advantages of steel over iron in shipbuilding, the actual form of the ship's hull was also subject to a variety of experiments. The reason for



**The turret steamship "Rigel," of Stockholm, at Philadelphia. Photograph by J. D. Wilson, Blundellsands.**

this attempt to revolutionize the shape of the ship's hull was that naval architects were trying to find a shape whereby the actual carrying capacity of a ship was increased, while her tonnage remained equal to or less than that of a normal ship of similar dimensions. It must be remembered that in terms of the sea tonnage, except deadweight tonnage, is measured by volume and not by weight.

The turret decked ship made its first appearance in 1892. This type of ship had an extremely narrow deck, with the ship's side curving to form a shelf immediately above the waterline and then continuing to form the usual shaped hull. By using this type of vessel the shipowners avoided paying heavy port and canal dues, because many authorities gauged dues on the area of a ship's deck. The turret ship had the dimensions of a large cargo ship, but had the deck area of a much smaller vessel.

The first turret decked steamer was built as an experiment by Messrs. Doxford of Sunderland. She was named "*Turret*" and had a length of 439 ft. 8 in. Her beam was 51 ft. 7 in., the gross tonnage was 5,995 and the net tonnage 3,794. She was sold to Messrs. Peterson Tate and Co. for their Canadian trade. She was a good cargo carrier, and strong lashings of timber could be carried on the shelves, while the shape did not interfere with the cargo capacity.

Other shipping companies became interested in this class of vessel, particularly the Clan Line, and a stream of turret ships came off the slipways including the "*Tulloch Moor*," the "*Garryvale*" and the "*Rigel*," which is shown in the accompanying illustration. They were good sea-ships, but in the hands of inexperienced men they gave a lot of trouble. So when the port and canal authorities of the world began to amend their regulations regarding dues gauged on deck area and started to use other methods, the class lost favour with the shipping companies and has now almost disappeared. J. D. Wilson (Blundellsands).

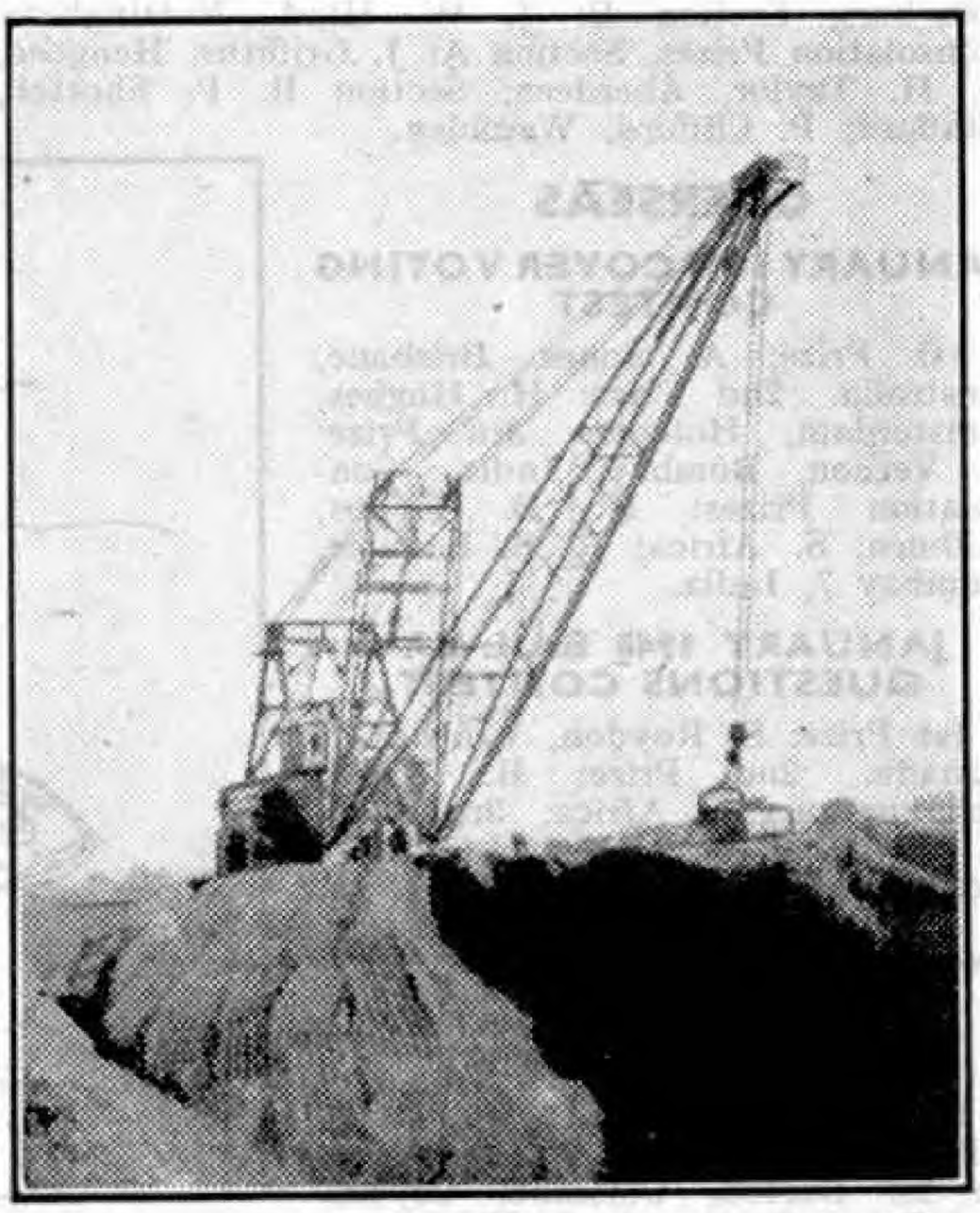
## A GIANT EXCAVATOR

What is claimed to be the largest excavator in the British Isles is in use on the coal outcrop site at Measham, near Ashby-de-la-Zouch. This massive structure has to be erected on every site it goes to, and this takes about three months. Inside the body is a 900 h.p. motor driven by electricity from two diesel-electric generators in the power house near by. The motion of the machine is that of the walking dragline. It has two feet, each 44 ft. long, and makes strides of 8 ft. The two feet are driven by huge eccentric cams.

The driver sits in the small cabin on top of the body. Towering above him is a colossal structure called the "A" frame. Cables supported by this move the mast, the large framework pivoted above the jib. The anchor ropes from the top of the mast support the jib in several places. The jib is 260 ft. long. The bucket weighs 19 tons and holds 24 tons, while the crane itself weighs 750 tons and is controlled by two men, with another in charge in the power station.

Open cast mining work of all kinds is specially interesting because of the huge excavating machines employed. In various forms they have been largely used for some time in the United States and in Germany for mining coal near the surface, and they are now being employed for this purpose in Great Britain.

J. T. Martin (Ashby-de-la-Zouch).



**A giant excavator at work on an open cast mining site. Photograph by J. T. Martin, Ashby-de-la-Zouch.**

**Power Across the Sea**—(*Continued from page 371*)

which do not require continual supervision. Norway already has power installations of this type. The plant starts and stops automatically, and adjusts itself according to the pressure of the water in the pipe lines.

It is estimated authoritatively that Norway's hydro-electric power could be developed to give no less than 240,000,000 h.p. At present, only one-sixtieth of that power has been tapped.

If Britain were to become a customer for the surplus Norwegian output, hundreds of thousands of tons of British coal now required to feed generating stations in the United Kingdom would be saved each year. The plan would help to eke out the supplies of "black diamonds" waiting to be mined in Britain, a not unimportant benefit, as experts report that those supplies will otherwise be used up within an easily measurable time. Oil, the alternative fuel, also has to be imported, and here again the sources will not last for ever. But Scandinavia's mountain streams are a continuous source of power. It is this knowledge that gives the project such vital value to Britain. Science can now not only harness the natural resources of the world, but distribute them where they are most wanted.

**British Jets Are Still the Best**—

(*Continued from page 374*)

fighter, which is probably the world's fastest war-plane. A picture of sleek, purposeful elegance from nose to tail, the N7/46 should fly at over 650 m.p.h. Its new double entry and exit engine air ducts in the wing roots leave the fuselage interior clear for installation of large fuel tanks, so that the N7 also has a longer range than any comparable jet fighter—a most important asset for a naval aircraft.

In the jet trainer class, Britain has an undisputed lead, for the "Mamba"-engined Avro "Athena" and Boulton Paul "Balliol" are the only propjet trainers in the world, while the "Meteor" 7 is by far the world's fastest training aircraft.

As far as jet bombers are concerned, Britain is definitely behind America and Russia, *at the moment.* But, apart from the revolutionary Boeing XB-47, all the foreign machines were probably designed originally for piston engines, and have had their jets fitted as an afterthought, whereas the British bombers when they come along will have been designed from the start to take full advantage of the tremendous power of their jet engines. Little can be said about them at the moment, but they are believed to include a twin-engined machine of advanced layout, a big six-jet Vickers bomber and an all-wing bomber.

There is no doubt whatsoever that Britain leads the world in jet air liners. The "Nene-Lancastrian" was the first air liner to fly with jets, the "Nene-Viking" is the first all-jet air liner and the new Vickers "Viscount" is the first propjet air liner—and there are others on the way. The Armstrong Whitworth "Apollo," Bristol "Brabazon" II, Saunders-Roe SR-45 flying boat and Handley Page "Hermes" V will all be fitted with propjets, together with new versions of the well-known Airspeed "Ambassador" and Miles "Marathon." Together they will retrieve our lost fortunes in civil aviation.

At present, Britain is the only country with a successful propjet—in fact several successful propjets, including the "Mamba," Rolls-Royce "Dart," "Theseus," Armstrong-Siddeley "Python" and Napier "Naiad." We believe there is a big future for this type of engine, which combines the power of a jet with the economy of a piston engine. The Americans have said that propjets are a waste of time, that manufacturers should go directly on to "straight" jets; but that may be because they have no satisfactory propjets! Anyway, even if straight jets are the ultimate answer, British air liners will still retain their lead, for the forthcoming revolutionary de Havilland "Comet," powered by four "Ghosts," is expected to outfly everything else over the Atlantic in the mid-1950s.

Yes, the future is bright for British aviation. Our aircraft industry is young, alert, led by men who pioneered flying and still believe in its future. The important thing to remember is that the aircraft and engines mentioned in this article are those in Britain's aviation shop-window. We can be certain that still-secret types "under the counter" will ensure that British aeroplanes will always be best.

**Notes on the Netherland Railways**—

(*Continued from page 387*)

the two-hole fishplate.

Trains in Holland travel on the right hand side and I found that it was a common practice to switch trains over on to the other rail even at small stations. Apparently many Dutch stations have no passenger bridge and one has to walk across the rails. To avoid this as much as possible the trains are usually brought in at the main platform, which contains the booking office and refreshment and waiting rooms. On one occasion a train had been thus switched on to the left line and was standing in the station when shortly afterwards a train in the opposite direction arrived and was also switched over on to its "wrong" side. Thus the running directions were reversed. I was told that the signalling arrangements were such that an accident was almost impossible and this is apparently borne out by the good record of the Dutch Railways.

I was told that before the war over 50 per cent. of the Dutch system was electrified and it was intended to complete the electrification as soon as possible. However, the Germans destroyed much of the overhead equipment, and in parts this is only now being renewed. Holland also has modern diesel-electric trains, which I was told were also taken by the Germans and recovered from as far away as Rumania.

My short stay in Holland convinced me that the Dutch have done a good job in getting their railways running so well after the terrible mess which the war left them to clear up.

## ELLIOTT MODEL RAILWAY EXHIBITIONS

Those who read the reference in last month's "*M.M.*" to the Touring Model Railway Exhibition organised by Mr. H. Elliott, will be glad to hear that a descriptive booklet is available. This includes some general introductory matter and gives a full description of the Exhibition layout and its equipment. There are several illustrations of both model and actual railway interest.

Copies are obtainable from the Business Manager, Elliott Model Railway Exhibitions, 4, Double Street, Spalding, Lincs., for 8d. including postage.

## THE IRISH RAILWAY RECORD SOCIETY (JUNIOR BRANCH)

Irish readers of the "*M.M.*" will be interested in the activities of the Irish Railway Record Society. The principal objects of the Society are to encourage interest in Irish Railways and in railways generally, and to provide facilities for discussions, outings and so on of a railway character. The collection of railway photographs and documents, and the publication of a quarterly journal, also form part of the Society programme.

The Junior Branch caters specially for members between the ages of 12 and 18 years and has similar aims and objects to the senior section.

Readers who wish for further details, should get in touch with Mr. D. Morris, Hon. Sec. I.R.R.S., Junior Branch, 21, Idrone Terrace, Blackrock, Co. Dublin. Eire.

## BINDING THE "M.M."

Copies of the "Meccano Magazine" are now bound in volumes in official covers by Messrs. T. L. Duncan, 20, Cumberland Street, Liverpool 1. These covers are in cloth and leather, and have the name and the year embossed in gold on the back. The cost of binding the 12 issues of each volume of the Magazine of the present size, that is of the volumes since 1942, is 11/6, including return carriage.

# Fireside Fun

"What's a cannibal?"
"Someone who loves his fellow-men—with gravy."

* * * *

"Have I hurt him yet?"
"No, but keep on swinging. The draught might give him a cold!"

* * * *

"This book says big fish in the sea eat up the little sardines, mother."
"Yes, I think that's right."
"But how do they open the tins?"

* * * *

Teacher: "Now tell Johnny you are sorry you hit him on the chin, Billy."
Billy: "I'm sorry I hit you on the chin, Johnny. I meant to hit your nose."

* * * *

"What is meant by a clean sweep?"
"Oh, that's easy. One who has just had a bath."

* * * *

"Why must I always do as I am told, mum?"
"Well, when I was a little girl I always had to do what your grandmother told me."
"Why did she think that?"
"Oh, I suppose her mother told her."
"H'm. Who started this silly game, I wonder."

* * * *

### THIS MONTH'S HOWLER

The femine of Czar is Sardine.

* * * *

"You've got it upside down, mister!"
"Don't worry. I'm a bookstall manager."

### BRAIN TEASERS

### OLD AND NEW

By putting letters into the numbered sections below, in accordance with the following clues, build up the names of two aircraft, one of the future and one of the past. The clues are: 1, 3, 8, Prohibit; 2, 7, 4, 15, 16, Bird; 9, 15, 11, 12, Fastening; 14, 16, 10, 2, Former British railway initials; 2, 5, 6, 13, Demolish.

G.E.A.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

* * * *

"Well here we are, and we haven't forgotten anything."
"Really! But you've come to the wrong house!"

* * * *

### A GOAL PUZZLE

A football team had played three matches at home, winning two of them, and two away, one of which was drawn. The team's goal average at home was 2–2, and that away 0–3. What were the scores in the five matches?

* * * *

### EASY TO SEE THROUGH

A boy was given two jugs, one of which held five pints and the other three pints, and told to fetch exactly four pints of water from the pump. He had nothing else that would hold water, but after a little thought he solved his problem and returned with four pints of water in the larger jug. How did he do it?

M.B.

* * * *

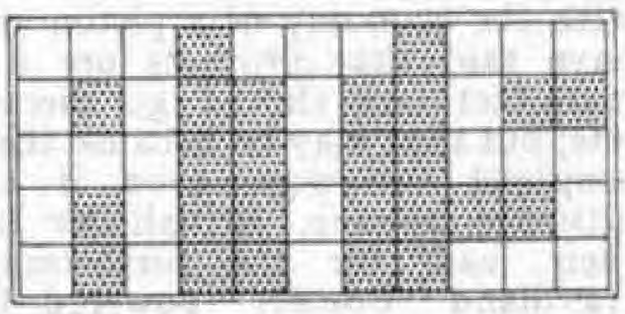
### WELL-KNOWN

Here is a sentence with missing words, each letter of which is denoted by an asterisk. "A * * * * * * * surgeon was * * * * * * * * to operate because there was * * * * * * * * *." The letters of the missing words are the same in each case, arranged in exactly the same order. Complete the sentence.

* * * *

### SOLUTION TO LAST MONTH'S PUZZLE

The branch of the Services in our puzzle last month was the A.T.S., and the accompanying diagram shows how the additional squares are shaded to give this result.



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(See also pages 402 and 404)

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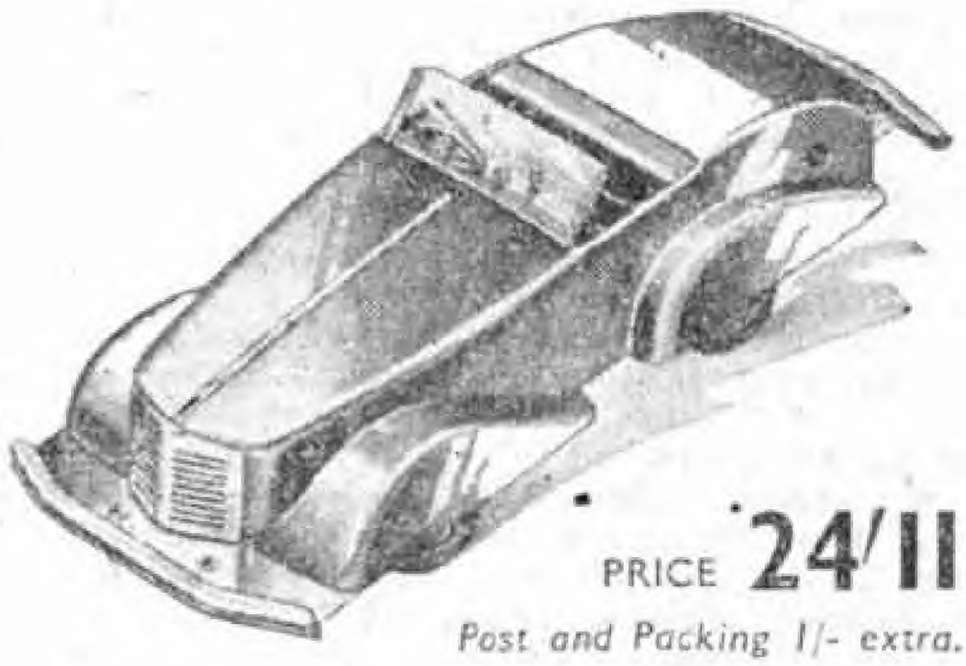

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